21E Program Evaluation

Draft Generic Environmental Impact Report

Prepared by

the Massachusetts Department of Environmental Protection

and

the Board of Registration of Hazardous Waste Site Cleanup Professionals

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Introduction and Executive Summary

This Generic Environmental Impact Report (GEIR) summarizes the results of an evaluation of the Waste Site Cleanup Program authorized by General Law Chapter 21E (the Massachusetts "Superfund" Law). Chapter 21E gives the Department of Environmental Protection (DEP) the task of ensuring that releases and threats of release of oil and hazardous material are cleaned up by the parties responsible for them.

In 1992-3, DEP substantially redesigned the Commonwealth's Waste Site Cleanup Program to speed the assessment and cleanup of releases of oil and hazardous materials to the environment. DEP and the Board of Registration of Hazardous Waste Site Cleanup Professionals have evaluated this program to see how well it has worked over the past five years. This evaluation satisfies three commitments to review the 21E program:

- by relying heavily on the expertise for site assessment and cleanup in the private sector, the 1993 program represented a very different approach from that taken by other states and Massachusetts in the past to ensuring that disposal sites are adequately addressed. When the program was implemented, DEP promised to evaluate it when the agency (and other stakeholders) had gained some experience with it, to identify areas that need to be improved;

- Executive Order 384, signed by Governor Weld on February 9, 1996, required a comprehensive review of all Commonwealth regulations, including DEP's regulations implementing the 21E program; and

- MEPA Certificate #9307 (issued on March 26, 1993 for the revisions proposed in the regulations implementing c. 21E, the "Massachusetts Contingency Plan," or "MCP") required DEP to file a generic ENF to determine whether a generic EIR should be prepared to evaluate the new program's effectiveness. This generic ENF was filed in June 1997. The resulting MEPA Certificate #11203 (issued on August 8, 1997), required DEP to prepare a generic EIR to ensure maximum public awareness of and input into DEP's program review. Appendix 2 contains a copy of this Certificate and public comments submitted on the June 1997 generic ENF.

Background

General Law Chapter 21E, enacted in 1983, gave DEP the task of ensuring permanent cleanup of oil and hazardous material releases by the parties responsible for them.

In 1986, Massachusetts voters overwhelmingly approved a binding ballot question that gave DEP specific deadlines and quotas for finding and assessing hazardous waste sites, ensuring their timely cleanup, and expanding public participation in the process. But these new requirements led to bureaucratic and environmental gridlock. The program was based on direct DEP oversight of assessment and cleanup work, something the agency never had the necessary funding to provide.

By 1990, the number of known and suspected sites across the Commonwealth far outstripped DEP's ability to oversee responses at all of them. Fewer than one-quarter of the hazardous waste sites in Massachusetts were being worked on actively and only a handful of cleanups were being completed in any given year. Everyone with an interest in the program agreed that a new approach was needed.

In 1990, DEP formed a public/private Study Committee to determine what government and the private sector each did best and to develop a new vision, one ultimately shared by all major stakeholders, for accelerating cleanups without compromising environmental standards. Legislation enacted in 1992 and revised Massachusetts Contingency Plan (MCP) regulations in 1993 expanded the private sector's role for cleanup of most sites, focusing limited government resources on the worst sites and on those tasks that government needs to perform to ensure that sites are addressed appropriately.

In the new program, DEP focuses its oversight on the most serious sites. At lower risk sites, property owners and other potentially responsible parties (PRPs) hire state-licensed private environmental professionals (known as "Licensed Site Professionals" or "LSPs") to evaluate site conditions and oversee response actions. DEP audits the results at a percentage of all sites each year to ensure adherence to state cleanup standards. The Board of Registration of Hazardous Waste Site Cleanup Professionals (the "LSP Board") licenses and regulates LSPs.

PRPs are required to notify DEP of releases and threatened releases of oil or hazardous materials that exceed specific thresholds. Within one year of this notification, all sites which have not completed cleanup work must be evaluated using a quantitative ranking system and classified either Tier I (A, B, or C) or Tier II. At Tier I sites, PRPs must obtain a DEP permit to proceed with comprehensive response actions, and the most complicated of these (Tier IA) are subject to direct agency oversight. At Tier II sites comprehensive response actions may proceed without prior approval or oversight by DEP. Sites where PRPs fail to classify their sites by the one year deadline are classified as "default Tier IB" and risk DEP enforcement. When PRPs have completed cleanup work, they must file Response Action Outcome Statements (RAOs) signed by an LSP to document the achievement of a permanent or temporary solution.

Other key features of the new program include:

- Clear release notification thresholds that screen out problems not likely to pose significant risks to public health or the environment;

- Opportunities and incentives for cleaning up small problems quickly and reducing risks;

- Performance standards that allow the level of investigation to be set by the nature of the problem (DEP sets standards but does not dictate how to meet them);
- Generic cleanup standards for the most common contaminants, eliminating the need for detailed risk assessment and uncertainty about "how clean is clean enough;" and

- Consideration of future land use so that sites intended for commercial or industrial development, for example, do not have to be restored to the cleaner conditions required for residential development – resulting in considerable cost savings.

Since the new Waste Site Cleanup Program started operation in 1993, there has been a significant increase in the overall amount of cleanup and number of sites reaching closure. Since the new program took effect:

- Approximately 10,000 releases exceeding notification thresholds have been reported to DEP;

- More than 9,500 risk reduction measures have been implemented (approximately 7,300 mandatory Immediate Response Actions and 2,200 voluntary Release Abatement Measures);

- More than fourteen times as many sites[1] have been cleaned up or closed out in the first four years of the new program than in the last four years of the old program (approximately 3,146 sites compared to 225); and

- More than 7,200 assessments and/or cleanups (of sites and spills) have received LSP "sign off" (i.e., a Response Action Outcome or "RAO" was filed) to get out of the MCP system (approximately 1,600 of them for sites that had languished for years under the old rules).

Approximately 90% of all RAOs filed show that releases have been either cleaned up to background conditions (38%) or meet the MCP's most stringent cleanup levels (52%), making the sites suitable for unrestricted use.

Program Evaluation Goals

The Scope of Work for this evaluation identified seven key questions:

- Is reliance on the private sector working?
- Is DEP focusing where it should?
- Are cleanup standards adequately protective of health and the environment?
- Are there ways to make the 21E program more cost-effective?
- Is the public being adequately informed of and involved in cleanup decisionmaking?
- How should the performance of the program be measured?
- How can the MCP be streamlined?

This report seeks to answer these questions.

Methodology

[1] Excluding spills in the old program that were permanently cleaned up under DEP Emergency Response oversight and 2- and 72-hour releases which achieved an RAO in the new program.

To evaluate the 21E program, DEP and the LSP Board gathered data from a number of different sources (described below). DEP also hired a management consultant, TechLaw Management Consultants, Inc., to review the audit component of the program in the context of overall compliance and enforcement efforts. DEP reviewed and analyzed the data collected, and, with the advice of the Waste Site Cleanup Program Advisory Committee[2], developed the recommendations and options for program improvements found in this report. The LSP Board also reviewed the data collected and developed recommendations for improving its component of the Commonwealth's Waste Site Cleanup Program.

Information sources:

- Databases - DEP generated information from agency databases to develop a comprehensive "picture" of what is happening in the redesigned program (e.g., numbers of sites/response actions, how long response actions take, status of sites, compliance rates, where DEP spends its time, publicly funded actions taken, bond fund spending and revenue data, etc.). Unless otherwise indicated, all data in this report is as of March 1, 1998.

- Site files - DEP reviewed site files to obtain information not contained in databases, including the administrative and technical completeness / adequacy of Activity and Use Limitations (AULs), the adequacy of background feasibility evaluations and Phase III evaluations for Class C Response Action Outcomes, and whether DEP was receiving copies of notices to public officials that PRPs must make during response actions.

- Audit and inspection results - DEP reviewed audit findings to determine what components of the MCP the private sector is having difficulty complying with, and reviewed inspections of treatment systems to see if they were operating properly.

- Written surveys - DEP sent surveys to program stakeholders to solicit feedback on how the program is working. Surveys were sent to the following audiences:
    - LSPs, DEP staff, environmental consultants, and attorneys;
    - Concerned citizens, environmental advocates, and local officials;
    - Site owners and operators; and
    - Lenders.

- Telephone surveys - DEP called key citizen contacts for a sample of Public Involvement Plan sites to solicit feedback on how the public involvement program component is working.

- Focus groups - DEP met with program stakeholders in small focus groups, including groups of DEP staff, LSPs, environmental/citizen advocates, citizen groups, site owners and operators, lenders, attorneys, and local officials to solicit feedback on how the program is working.

[2] A list of Committee members is found in Appendix 2.

Summary of Major Findings and Recommendations

- As noted above, the privatized program, which relies on the expertise and resources of the private sector, has successfully allowed people who want to proceed with cleanup to do so, with minimum involvement by DEP. Essentially, the redesigned program has clearly accomplished one of its primary goals, which was to remove government-related obstacles for people who want to proceed with assessments and cleanups.

- The program's reporting thresholds and incentives for early action (including reducing risks) have ensured that many small contamination problems are dealt with completely and quickly once they are reported to DEP. Very small problems that are not likely to pose significant risk for health, safety, public welfare or the environment (and therefore do not need state attention) are not entering the program.

- These changes have allowed DEP to focus its resources on the areas that require government attention: developing standards for making assessment and cleanup decisions, oversight of oil and hazardous materials emergencies and sites presenting high levels of risk for public health and the environment, and checking on private sector work to make sure that it complies with DEP's requirements.

- There is a need to improve and continue to develop the redesigned program in four key areas:

    1. While private response actions have been generally adequate in terms of basic cleanup decisions, the overall quality of work needs to be improved to foster better confidence in it by key stakeholders. These stakeholders include citizens and local officials (who have to live with the results of site cleanups over the long term), real estate developers and financing institutions (who are involved when property is sold or leased), the businesses and individuals who pay for assessments and cleanups (who want to make sure that they are getting good advice from their LSPs), LSPs (who have to compete for business in the market place and need a "level playing field"), and DEP staff (who can turn their attention to contamination problems that the private sector is not dealing with once they are confident that private sector work generally meets established standards). Key government efforts in this area will be fine tuning of DEP's performance standards, development and implementation of DEP's compliance assistance and enforcement tools (including changes in the agency's audit program), and fine tuning of the LSP Board's program. Ultimately, this will require an improved commitment by LSPs and their clients to performing work that meets a standard of care that is both reasonable and diligent.

    2. While the incentives for private parties to take responsibility for addressing contamination appropriately have spurred much "voluntary" cleanup over the last five years, they are not sufficient by themselves to ensure that private parties are progressing toward cleanup at all sites. DEP needs to develop enforcement tools and use them against parties who are not

performing response actions. This effort needs to be implemented concurrently with the recommendation above: the agency needs to focus on *both* making sure that private work is adequate and that people who are not meeting their responsibilities do so.

3. While there has been substantial progress on assessment and cleanup of some of the Commonwealth's worst contamination problems, DEP needs to look for ways to improve the efficiency and effectiveness of this component of the Waste Site Cleanup Program. This effort should focus not only on sites that have been classified as "Tier IA," but also on sites where risks can be substantially reduced, controlled or eliminated through preliminary response actions. In addition, DEP needs to continue to develop its site discovery program, to ensure that major contamination problems are identified as early as possible, and that the sources of contamination are found and controlled as quickly as possible.

4. DEP needs to continue to update its standards, regulations, and policies governing decisionmaking about how to investigate and clean up sites. DEP needs to ensure that they are based on current scientific and technical knowledge, and that they permit, to the extent feasible, flexibility to tailor cleanups to the uses that will be made of the site.

Since the redesigned 21E program started operation in 1993, it has been nationally recognized for its innovative approach. In 1995, the Program received an "Innovations Award" from the Council of State Governments. And, over the last several years, the American Society for Testing Materials and several other states have adopted the approaches that DEP has developed for identifying and characterizing risks presented by sites, and for making cleanup decisions that are both practical and protective of health, safety, public welfare and the environment.
The evaluation summarized in this report shows that the Commonwealth has demonstrated its commitment to finding better ways to protect the environment by capitalizing on the strengths of the program's stakeholders.

At the same time, DEP and the LSP Board recognize that there is a need to continue to improve this program. The redesigned program was based on a balance of the variety of needs of its stakeholders, and was developed with significant participation by affected parties. To ensure that the program continues to address the needs of these parties in a balanced way, DEP and the LSP Board invite public comment on the specific findings and options for improvements presented in this Draft Generic Environmental Impact Report, and look forward to continuing public discussion.

Written comments on this Generic Environmental Impact Report should be submitted by close of business on August 25, 1998, to:

MEPA Unit
Executive Office of Environmental Affairs
100 Cambridge Street, 20th Floor
Boston, MA 02203

The remaining chapters of this Generic Environmental Impact Report describe the findings and options for improvements in specific components of the Waste Site Cleanup Program:

- Chapter 1 examines whether more cleanups are occurring at a faster pace compared to the old program and whether the MCP tools for reporting and cleaning up sites are working as intended.

- Chapter 2 evaluates the adequacy of response actions being performed by the private sector and what improvements should be considered to further ensure that cleanups meet appropriate standards of care.

- Chapter 3 examines whether DEP has been able to focus its resources on finding and ensuring cleanup of the worst sites, maintaining a strong compliance and enforcement program, and developing technical standards and guidelines.

- Chapter 4 evaluates whether the program's standards are set appropriately to protect public health and the environment.

- Chapter 5 evaluates whether sufficient public involvement opportunities are being provided in the privatized program and whether the MCP provides adequate public review so that MEPA review of individual sites is not needed.

- Chapter 6 evaluates the cost of conducting response actions and whether there are opportunities to improve cost-effectiveness.

- Chapter 7 contains options for measuring the success of the 21E program.

- Chapter 8 contains suggestions for streamlining the MCP.

- Chapter 9 is an evaluation by the LSP Board of the LSP licensing program.

Chapter 1: Is Reliance on the Private Sector Working?

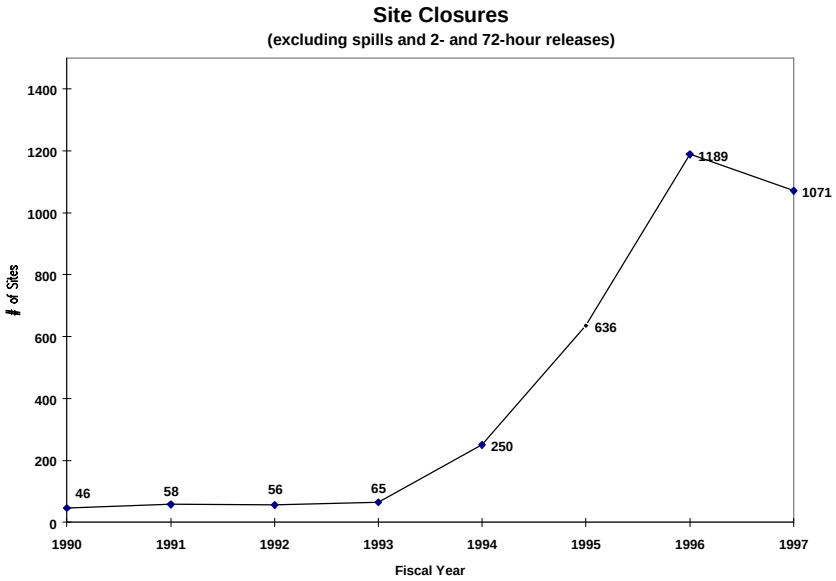
A major premise of the redesigned program is that the private sector has the resources and the expertise to address the majority of contaminated sites, and that the government should leverage these resources to the fullest extent possible, allowing it to focus its limited resources where they are needed most. The primary way the program does this is through the LSP program. LSPs make decisions about what is required to clean up sites and provide opinions that site cleanups meet the MCP's performance standards. By eliminating upfront approvals from DEP, a greater number of cleanups can occur in much less time because PRPs do not have to wait for state approvals. Other ways the program encourages voluntary response actions is by establishing clear notification thresholds, providing opportunities for early risk reduction, establishing deadlines for conducting work, and clear endpoints for the assessment and cleanup process. This chapter of the GEIR evaluates whether more cleanups are occurring at a faster pace compared to the old program and whether the MCP tools for reporting and cleaning up sites are working as intended.

Completed Cleanups

Since the new program started, 7,465 assessments and/or cleanups (of sites and spills) have been completed and documented in an RAO: 7,222 signed by LSPs and 243 signed by DEP staff. Of these, 6,702 (90%) were Class A RAOs indicating that cleanup eliminated or reduced contamination to levels that pose no significant risk. The remaining 763 were Class B RAOs, meaning that a release was reported but was shown to pose no significant risk and therefore no cleanup was needed. LSPs also signed 138 Class C RAOs, indicating that a permanent solution is currently not feasible but that a temporary solution eliminating substantial hazards has been achieved.

In addition to RAOs, 1,157 sites were closed out by means other than an RAO: private parties filed 319 Waiver Completion Statements, 73 closure letters, and 260 No Further Action decisions signed by LSPs in accordance with the MCP's transition regulations; and DEP staff reviewed and "closed out" 505 sites after determining that a release had been adequately addressed or had not occurred, or that there was not enough information available to keep the site on DEP's list.

These numbers represent a significant increase in the pace of cleanups and site closures compared to the old program. More than fourteen times as many sites were closed out in the first four years of the new program (FY94 - FY97) than in the last four years of the old program (approximately 3,146 sites compared to 225). For the more serious sites, an even bigger increase occurred: in the last four years of the old program, only 3 priority sites completed cleanup, while in the first four years of the new program, 68 former priority sites completed cleanup (these former priority sites all started off in the new program as Tier IA sites, but most were subsequently downgraded by DEP because they no longer needed direct oversight).



The increased pace of cleanup has substantially reduced the backlog of sites that existed in the old program. When the new program took effect in 1993, there were more than 6,800 sites that required further action (referred to in the new program as "transition sites"). Of these, 3,057 have been closed out in the new program. In contrast, only 564 sites were closed out in the old program. For the first time DEP has experienced a downward trend in the size of the total universe of sites. While the site universe increased every year in the old program, it has decreased almost every year in the new program. Currently, 53% of all transition sites (3,621 of 6,830 sites) and 67% of new releases (6,326 of 9,380 releases) have been closed out.

For new releases reported more than one year ago (i.e., reported in fiscal years 1994 - 1996), 77% have achieved an RAO. Sixty-five percent of these releases were cleaned up within one year of notification. This figure shows that the new program is allowing the efficient cleanup of releases. The remaining releases were Tier Classified, and have five years to achieve a permanent solution.

In focus groups and through surveys, DEP staff, LSPs, PRPs, citizens and others all agreed that the new program is allowing more sites to be cleaned up at a faster pace. DEP staff reported that they were able to focus on higher priority sites in the new program. In the old program, there was tremendous pressure to get involved in lower priority sites that were undergoing real estate transactions and/or construction. These sites consumed a significant amount of time but were not always ones that posed serious risks. In the new program PRPs who want to clean up property for sale or development can do so in most cases without DEP involvement, freeing up DEP staff to focus on higher priority sites.

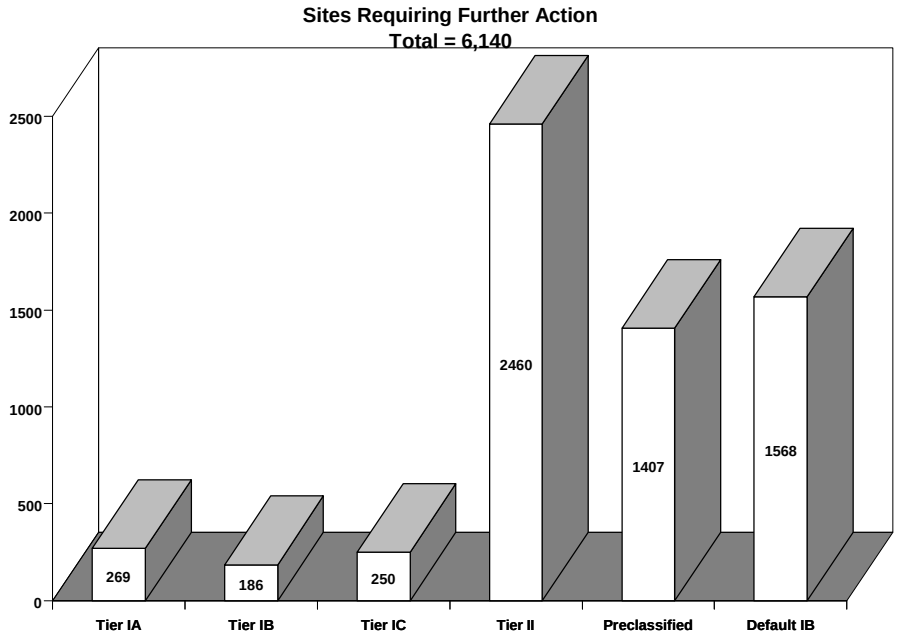
Overall, do you think response actions are proceeding at a faster pace than in the old 21E program?				
	Faster	**Slower**	**No change**	**Unsure**
DEP Staff	83%	5%	5%	7%
LSPs	89%	4%	6%	1%
Consultants	68%	0%	14%	18%
Citizens	26%	12%	12%	50%
Health agents	63%	4%	31%	2%

Overall, PRPs reported that the new program is better, due to consistent standards, the ability to move forward, and the ability to get site closure. The removal of uncertainty has been a big incentive to move forward; PRPs can better manage schedules and budgets in the new program. They also believed that cleanups are more protective, since little problems can be addressed more quickly than in the old program. PRPs also said that many sites are being redeveloped that previously would not have been.

LSPs reported that they found the program to be more reasonable because they can use risk assessment to reach cost-effective solutions to contamination problems, and reported that the program is also more flexible. LSPs reported seeing more sites moving forward with cleanup.

Site Universe

As of 3/1/98, the universe of sites in need of further action totals 6,140, and includes 1,407 "pre-classified" sites that have not yet reached the one-year deadline for Tier Classification (and must either clean up or Tier Classify by this deadline), 3,165 Tier Classified sites[3] that have five years from the date of Tier Classification to complete a cleanup or implement a long-term remedy, and 1,568 "default Tier IB" sites that have missed the deadline for Tier Classification and are in noncompliance. These default sites are subject to DEP enforcement (see Chapter 3).



Release Notification

The original MCP (promulgated in 1988) included criteria for reporting sudden releases of oil and hazardous materials, but provided no guidance on reporting other release or site conditions that

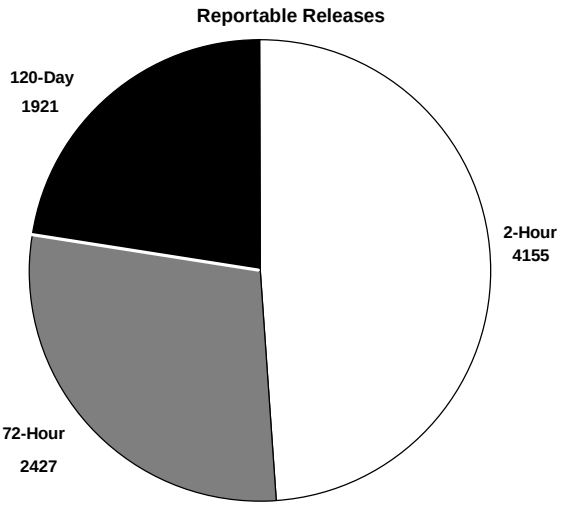
[3] 76 of the 269 Tier IA sites are included on the federal Superfund National Priorities List (NPL); The U.S. Environmental Protection Agency (EPA) lists the number of NPL sites in Massachusetts as 30. DEP's number is higher because the Massachusetts Military Reservation site is listed as 47 Tier IA sites in DEP's list.

warranted an immediate response or on reporting "historical" contamination. Uncertain about what DEP would consider significant but wanting to comply with the law, private parties would report almost any amount of contamination discovered. As a result, there was exponential growth in the number of sites waiting to receive a clean bill of health from DEP.

The broad-based Study Committee that helped DEP redesign the program believed that more specific reporting thresholds were needed to provide certainty to PRPs and to identify those releases that could pose a risk while at the same time keeping locations with minimal levels of contamination out of the system. In addition, a process was needed to quickly reach a decision that no further cleanup was needed for small releases.

The 1993 MCP established three categories of releases that must be reported to DEP: those requiring notification within 2 hours (e.g., spills above Reportable Quantities and Imminent Hazards), within 72-hours (e.g., leaking underground storage tanks), and within 120 days (e.g., contaminants detected in soil and groundwater above Reportable Concentrations where there is no immediate threat to health and the environment). For 120-day releases, if a "Limited Removal Action" (i.e. the removal of up to 100 cubic yards of petroleum contaminated soil or up to 20 cubic yards of soil contaminated with hazardous material) reduces contaminant concentrations to below RCs, no reporting is required.

Since the start of the new program, 10,013 releases of oil or hazardous material exceeding notification thresholds have been reported to DEP. In addition to these reportable releases, DEP Emergency Response staff received notice of 3,602 releases which were not reportable and 3,210 general complaints and/or inquires from citizens and local officials.



The release notification criteria appear to be working well: they are "screening in" sites that pose a significant risk and are "screening out" many sites that do not pose risks. For instance, of all the RAOs filed for releases reported in the new program, only seven percent were Class B-1, meaning that a reported release was shown to pose no significant risk without the need for any cleanup. Another two percent of RAOs were Class B-2, indicating that a release did not require cleanup provided that an AUL was used to restrict site uses to prevent exposure to contaminants. This shows that the notification criteria are set right, since the vast majority of releases which exceeded notification thresholds actually required cleanup to achieve no significant risk DEP's survey results (see Appendix 1, Section 2, questions 11 - 15) confirm that the notification criteria are keeping insignificant releases out of the system and that mechanisms exist to quickly address small

releases that do enter the system. However, there are some specific issues that should be addressed (see Chapter 8 for additional suggestions):

- The discovery of surface water contamination above acute Ambient Water Quality Criteria currently does not trigger an Immediate Response Action. This condition should be added to the 2- or 72-hour notification criteria.

- A condition of Substantial Release Migration does not formally trigger notification, even though the PRP has to "report" it to DEP within 72 hours and propose an IRA. Confusion would be reduced by adding this to the 72-hour notification criteria. Also, the specific criteria for identifying these conditions need to be clarified.

- Sometimes it is difficult to determine whether a condition poses an Imminent Hazard and therefore requires reporting to DEP within 2 hours. A more detailed description of Imminent Hazards for human health and ecological health is needed.

Limited Removal Actions

Limited Removal Actions (LRAs) may be taken prior to notification to DEP of "120-day notification" releases. The goal of an LRA is to address small quantities of contaminated soil[4] in a manner which will eliminate the need for notification. LRAs are designed to keep small releases out of the system. DEP's survey results show that there is a general consensus that the LRA is meeting its goal.

Are LRAs keeping small historical releases out of the system?

	Most	Some	Not Enough	Unsure
DEP staff	42%	48%	5%	5%
LSPs	39%	46%	13%	2%
Consultants	18%	57%	11%	14%

While some LSPs believe that a lot of LRAs are being conducted, others have commented that the number of LRAs they are asked to conduct seem to be in decline, partly because the 120-day notification period has usually elapsed by the time an LSP is brought in[5] and the work scoped out. These LSPs argue that the 120-day window is too short to be effective.

One LSP noted that some companies use LRAs to avoid a wider site investigation for fear of what will be found, particularly at urban sites. DEP staff have also expressed concern about abuse of LRA provisions, especially the use of LRAs to deal with multiple areas of contamination, when a property really needs a more comprehensive approach. One commenter noted that frequently LRAs are conducted during property transactions, the sale goes through, and the new owner finds reportable levels in the area of the LRA.

[4] Not more than 100 cubic yards of soil contaminated by oil or waste oil, or 20 cubic yards of soil contaminated by hazardous material.

[5] Please note that an LSP is not required to conduct an LRA.

Are Limited Removal Action excavation limits being exceeded without notification to DEP?				
	Most	Some	Not Enough	Unsure
DEP staff	39%	47%	7%	7%
LSPs	3%	43%	44%	10%
Consultants	11%	39%	25%	25%

DEP has found that LRAs are often begun at sites when it should have been evident that the amount of contaminated soil exceeds the limits for an LRA. In fact approximately half of LSPs (51%) and the majority of DEP staff (92%) responding to DEP's survey believe that excavation limits are being exceeded without notification to DEP at least sometimes.

DEP staff have suggested that the regulations need to more clearly state the purpose of LRAs (i.e., that they are for problems known to be small) so that PRPs, consultants, and LSPs better understand their scope. The regulations could be improved by prescribing specific starting conditions for LRAs to avoid open-ended chasing of unknown contamination. LSPs have suggested that there should be more flexibility with the LRA volume limits: at sites that require the removal of slightly more than 100 cubic yards, the LSP should be able to continue the LRA based on their judgment that the site is still a "minor problem." DEP is uncomfortable with raising LRA limits since they are designed to deal with minor releases. Several LSPs also have suggested that DEP should require LSPs to conduct LRAs to increase accountability and cut down on potential abuses.

Accelerated Risk Reduction

The 1988 MCP did not have clear criteria for which releases required an accelerated response action and did not include procedures for taking risk reduction actions. As a result, PRPs were often uncertain about what was an appropriate response action. In addition, response actions were often not adequately documented.

The new MCP provides opportunities and incentives for PRPs to reduce risks early. Risk reduction measures can lead to permanent cleanups of smaller releases, improve conditions when longer-term cleanups will be necessary, and lower a site's ultimate Tier Classification. Immediate Response Actions (IRAs) must be taken, subject to DEP approval, whenever a sudden release or other time-critical situation is encountered (i.e., any release that triggers a 2- or 72-hour notification threshold). Other early actions, known as Release Abatement Measures (RAMs) and Utility-related Abatement Measures (URAMs), can be voluntarily taken to reduce risks and lower future cleanup costs. IRAs, RAMs, and URAMs can generally be performed at any point in the overall assessment and cleanup process.

Table 1-1
Risk Reduction Measures

	Implemented	**Resulted in RAO***
IRAs	7,336	4,722
RAMs	2,218	865
URAMs	130	10

* This number may increase as ongoing risk reduction measures are completed.

Since the new program started, private parties have conducted 7,336 IRAs to respond to spills, imminent hazards, and leaking underground storage tanks. DEP conducted 214 IRAs where private parties were unable or unwilling to do the work. Private parties voluntarily conducted 2,218 RAMs and 130 URAMs. For the majority of sites that have been cleaned up, an IRA or RAM was all that was needed.

Do you believe that risks are being reduced more quickly in the new program?				
	More Quickly	**Less Quickly**	**No Change**	**Unsure**
DEP Staff	70%	2%	21%	7%
LSPs	80%	4%	14%	2%
Consultants	57%	4%	25%	14%

Stakeholders have reported that risks are being reduced more quickly in the new program. DEP staff and LSPs indicated that many more source areas are removed in the new program compared to the old program, and small problems are being quickly dealt with.

While risk reduction measures are working well, a number of possible improvements were noted by stakeholders:

- 90 days should be allowed rather than 60 days to close out IRAs before an IRA plan is due; most actions take more than 60 days.

- Some LSPs would like DEP to review and comment on IRA and RAM plans instead of using a presumptive approval approach. Presumptive approvals send the message that DEP is not interested in a site. This leads PRPs to take a "sit-back-and-wait" approach. While early involvement by DEP can help the LSP keep the client focused and involved, DEP resources may not permit specific approvals of all these actions; other ways may be needed to ensure that PRPs do the appropriate work.

- Some LSPs complained about DEP second-guessing IRA plans when they did not have first-hand knowledge of the site, while work that is inconsistent with IRA approvals was mentioned by DEP staff as a problem.

- Some DEP staff believe IRAs should be allowed to continue after the condition requiring the IRA is abated, while others have argued that IRAs become the final cleanups but lack proper assessment and evaluation of remedial options.

- Some DEP staff were also concerned that RAMs should be scrutinized more closely by DEP. LSPs are performing full-scale remediations through RAMs without proper assessment activities.

- Soil excavation limits for RAMs should be revised; if a PRP is able to pay for disposal, the 500 cubic yard limit for "disposal" should be raised.

- DEP may consider oral approvals for RAMs in some circumstances (e.g., where contamination is encountered at a construction site). As with IRAs, oral RAM approvals would need to be followed up by confirmatory paperwork.

- For larger sites, DEP should consider annual or biennial reports of site progress in place of status reports for each individual action, and allow electronic submittals. For instance, at one large facility, many URAMs are conducted each year, which generates a lot of

paperwork. This paperwork should be consolidated. It would be helpful to have a generic URAM plan covering the whole facility, with periodic reporting of activities.

Contaminated Soil Management

One of the factors that has encouraged quick removal of moderately contaminated soil -- which can affect groundwater (by "leaching" of contaminants) and people (through direct contact) -- is DEP's innovative response to the difficulties of disposing of such materials. DEP has made it easier to send contaminated soil to recycling facilities and to Massachusetts landfills for reuse as daily trash cover (which costs less than disposing of the soil at out-of-state facilities).

Excavation and off-site management of contaminated soil is the most common cleanup strategy employed at sites in Massachusetts. The most common contaminants addressed are petroleum releases and urban fill ("downtown brown") that contain low to moderate levels of contamination (petroleum hydrocarbons, metals, and PAHs). To ensure that contaminated soil is handled properly, the MCP contains rules for storing, transporting, characterizing, treating and disposing of contaminated soils and other media to ensure that they do not end up being disposed of in places that will expose people to contaminants.

Almost 4,000 soil shipping documents (Bills of Lading) were authorized by LSPs during 1995-97 for a total volume of over 1.5 million tons removed from disposal sites, reducing risks to health and the environment. Just under 1 million tons was taken to asphalt batching plants, 450,000 tons to landfills for use as daily cover, 68,000 tons to thermal processing plants, and 9,400 tons to incinerators (see Table 1-2).

Table 1-2 Summary of Soil Volumes / Management Options

Year	**1995**	**1996**	**1997**	**Total**
# of BOLs	1,358	1,393	1,174	3,925
	tons	*tons*	*tons*	*tons*
Asphalt Batching	252,689	437,445	292,614	982,748
Landfill	149,042	179,063	123,180	451,285
Thermal Processing	17,725	30,081	20,601	68,407
Incineration	6,658	2,050	740	9,448
Total Tons	426,114	648,639	437,135	1,511,888

The yearly volume of soil has been fairly constant except for 1996 which showed a significant increase in soil volume. This could be due to increased excavation associated with the Central Artery Project in Boston or the 21J Underground Storage Tank Fund reimbursement program which became fully operational in the summer of 1995.

In the Fall of 1995 DEP conducted a number of compliance inspections at several asphalt batching plants. These inspections revealed that the majority of petroleum contaminated soil from 21E sites was not being incorporated into traditional asphalt paving for roads, but was being processed into engineered landfill cover materials. This means that the majority of contaminated soil is going to landfills. This could pose future problems for cleanups in Massachusetts, since more and more landfills are closing.

Options for Improvement:

- Examine current DEP polices regarding management of contaminated soil and encourage the use of innovative and traditional technologies that provide for destruction of contaminants as opposed to placing contaminants in landfills.

- Develop guidelines/criteria for determining safe uses of contaminated soil in the marketplace (e.g., asphalt products).

- Identify other low-cost management options for contaminated soil.

Compliance with Deadlines

The old program required that DEP directly oversee most site cleanups, but because DEP did not have the staff to oversee the thousands of sites in the old system, work proceeded only when PRPs had other incentives to move forward (e.g., to facilitate real estate transactions). In the new program, the MCP deadlines apply directly to PRPs and give them compliance incentives to conduct timely response actions. DEP set up the new program to provide additional incentives for timely work by requiring less paperwork and fewer fees for sites that exit the system quickly and meet timelines (e.g., 2- and 72-releases that are cleaned up within 120 days pay no fees; the first year's annual compliance fee is waived for sites that cleanup or Tier Classify by the one year deadline). As already described above, these incentives have contributed to a vast increase in the pace of cleanups. Beyond this increase, specific compliance rates with the major MCP deadlines show that the first year or "Front End" of the program is working well but that there is poor compliance with deadlines after Tier Classification. DEP plans to evaluate all of the MCP's timelines and submittal requirements in terms of reasonableness, as well as the amount and type of information requested in required submittals.

IRA, RAM and URAM deadlines - For all three of these risk reduction actions, a status report must be filed within 120 days of initiating the action and every six months thereafter until the action is complete. For IRAs, which are usually approved orally, a written plan and Release Notification Form (RNF) is required within 60 days of release notification/IRA approval. Table 1-3 shows the compliance rates for these actions.

Table 1-3
Submittal Compliance Rates for New Releases

	60 days	120 days	300 days
IRAs	53%	58%	83%
RAMs	NA	84%	88%
URAMs	NA	45%	60%

One reason offered by stakeholders for some of the missed deadlines is that LSPs work with a number of different sites and it is often difficult to track multiple deadlines for multiple sites. Also, PRPs want to focus their limited resources on conducting actual cleanup and sometimes place a lesser emphasis on paperwork submittals. Finally, in a few cases where there is a payment dispute between an LSP and a PRP, the LSP may refuse to provide the submittal to the PRP until the dispute is resolved. While PRPs may not be diligent in filing submittals by required deadlines, response actions are being implemented at many sites and within one year more than 80% of IRAs and RAMs are in compliance with documentation requirements.

1 Year Tier Classification deadline -- Most private parties are meeting the one year deadline to either complete cleanup by filing an RAO or Tier Classify the site as Tier I or Tier II. Sites which miss the one year deadline are designated as "default Tier IB" sites. Currently, only 411 releases reported in the new program are default Tier IB, and 124 of these are residential sites where home heating oil tanks have leaked. Homeowners face unique difficulties, including lack of resources, time required to process insurance claims, etc. (see Chapter 3, Homeowners).

Feedback from stakeholders indicates that the one-year deadline is a powerful incentive for private parties to complete response actions. There are a number of reasons for this: PRPs for smaller sites want to avoid the added expense of Tier Classifying their sites and PRPs who conduct response actions but miss the one year deadline must pay a compliance fee of $2,600 (the Tier IB rate) for the first year in the system and risk being listed in DEP's annual Tier I Site List. PRPs who do not conduct response actions are not be subject to fees, but would also be listed and would be subject to DEP enforcement. At the same time there have been some complaints that LSPs are tempted to take "shortcuts" to meet the one-year deadline (e.g., failing to gather enough rounds of confirmatory groundwater samples). Suggestions offered to remedy this problem and even further improve compliance with the one-year deadline include:

Table 1-4
Compliance with Tier Classification Deadline
Releases Reported in FY 94 - 96

FY94	76% (1,495 of 1,964)
FY95	83% (1,840 of 2,209)
FY96	85% (1,836 of 2,164)

As of 3/1/98, 6% of releases from these years remained in a default Tier IB status (411 of 6,337), translating to an eventual compliance rate of 94%.

- providing an exemption from the Tier Classification requirements for sites which will not need comprehensive response actions even though they will take more than one year to finish work (e.g., sites which "are wrapping up" or implementing small scale remedial actions).

- continue to implement DEP's "default Tier IB' compliance and enforcement strategy (see Chapter 3, Compliance and Enforcement).

Phase deadlines - The MCP establishes deadlines for Tier Classified sites for filing Phase Reports: a Phase II/III (i.e., Comprehensive Site Assessment and, if needed, Remedial Action Plan) is due within two years of Tier Classification, a Phase IV Remedy Implementation plan within three years, and an RAO within five years. If an RAO cannot be filed within five years but a treatment system has been implemented, a site would qualify for Remedy Operation Status (ROS). This status can be maintained for as long as required to clean up the site. If a site is not eligible for ROS, a Tier I or Tier II extension can be obtained to continue response actions beyond the five year deadline.

As Table 1-5 shows, the compliance rates for filing Phase reports is low. LSPs have reported that because after Tier Classification the next deadline is two years away, many PRPs put off work and do not think of starting Phase II work until a year to eighteen months later, when it is generally too late to meet the two-year Phase II/III deadline. Once this deadline is missed, it is difficult to catch up and meet the Phase IV and RAO deadlines. Another reason is that some sites that Tier Classify will not need comprehensive response actions (i.e., Phases II - V), but will be cleaned up by an ongoing RAM or IRA. In this case, PRPs are reluctant to spend the money to develop Phase reports when they

believe they will be able to file an RAO within a few years by just implementing preliminary response actions. Finally, a few highly complex sites require more time than the generic MCP timelines provide.

Table 1-5
Compliance with Phase Deadlines (New Releases)

	Owed	Rcvd by 2 yr	Rcvd late	Current Noncompliance
Tier I sites				
• Phase II/III	42	2	4	86%
• Phase IV	9	0	0	100%
Tier II sites				
• Phase II/III	298	21	18	87%
• Phase IV	59	0	1	98%

To increase compliance with Phase deadlines, DEP must increase compliance and enforcement efforts (please see Chapter 3, Compliance and Enforcement).

Downgradient Property Status

DEP recognizes that people whose property has been affected by contamination from an upgradient source may not be able to cleanup the site because they do not control the source of contamination. The MCP's Downgradient Property Status provisions allow people in this circumstance to provide DEP with information showing that contamination on their property is coming from an upgradient property. Once this information (called a "Downgradient Property Status Submittal") is filed in accordance with the MCP, the Downgradient Property Status becomes effective and DEP suspends the deadlines for Tier Classification and Comprehensive Response Actions and also suspends the assessment of annual compliance fees for the downgradient property owner. This suspended schedule allows time for the upgradient source to be discovered and brought into the MCP system, leading to a more comprehensive assessment and resolution of the contamination problem. The Downgradient Property Status (DPS) also includes requirements and incentives for downgradient property owners to communicate with and provide reasonable access to upgradient property owners so they can meet their MCP cleanup requirements.

Since the provisions took effect in February 1995, DEP has received 362 DPS Submittals. Through focus groups and surveys, DEP received a number of comments on the DPS provisions:

- There is no mechanism to ensure that upgradient property owners acknowledge that contamination from their property is affecting abutting properties. These owners have no burden to find out if they are the source of contamination.

- There are a number of sites asserting DPS with opposing LSP opinions. Private parties have asked DEP to intervene in some of these cases, but DEP's policy is not to perform audits on request. Dueling LSP opinions need an arbitration process.

- DPS puts a site in "suspended animation" with no resolution. Lenders are very wary of DPS.

Options:

- DEP has already informally suggested to private parties that agency involvement may be appropriate if private parties cannot resolve conflicting DPS claims through private dispute resolution. So far, no parties have approached DEP after exhausting private means of resolving disputes. Nevertheless, DEP should review its role in DPS cases, as well as what the role of private parties should be.

- In certain circumstances, DEP issues Notices of Responsibility (NORs) to owners of property upgradient of DPS filers. DEP should evaluate criteria for when NORs should be issued.

Chapter 2: What is the Quality of Private Sector Responses?

How well the new program is working is a function of not only the number of cleanups (as described in Chapter 1), but is also a function of the quality of private sector actions (i.e., how good is the work?). This chapter describes the activities DEP undertakes to monitor private sector work, what the data show about the adequacy of response actions being performed, and what improvements should be considered to further ensure that cleanups meet appropriate standards of care.

When the MCP was revised in 1993 to implement the redesigned program, its approach to regulation changed significantly. For the most part, the MCP now establishes performance standards, which set goals for assessments and cleanups, but do not provide specific directions for reaching them. This approach represents a significant departure from the original MCP (promulgated in 1988), which generally relied on DEP oversight to determine what appropriate response actions were on a site-specific basis (although some standards were specified, such as the acceptable levels of human health risk for permanent solutions).

The revised MCP is not a technical cookbook containing step-by-step recipes for conducting cleanups. Many technical decisions need to be made by LSPs and their clients that are not detailed in the MCP. For instance, the regulations do not specify the number or types of samples or analytical methods needed to adequately define the extent of site contamination. Instead, they require that contamination at a site be defined horizontally and vertically commensurate with the complexity of the site [see 310 CMR 40.0835(4)(f)], and that all data used to support cleanup decisions be scientifically valid and defensible and of a level of precision and accuracy that fits with its intended use (see 310 CMR 40.0017).

How these performance standards are reached is left up to the PRP and the LSP's professional judgment. This approach offers the ability to tailor the scope of site investigations to the nature and extent of contamination, so that small problems can be quickly assessed (partly to verify that they are in fact small), and that more complicated situations will get an appropriate level of attention. More specific minimum requirements for sampling and analysis (e.g., require 10 soil samples and 4 groundwater monitoring wells) would require too much work at small sites and not enough at large ones. Site investigation and cleanup regulations need to be flexible and not rigid to account for the variations in conditions found at individual sites across the Commonwealth.

Decisions about where to sample, how many samples to take, how to analyze them, and how the results determine subsequent response actions become the level of care provided for a site (in the same way that a doctor's decisions lead to diagnosis of a health problem and subsequent treatment for a person). The sum of these decisions statewide form the "standard of care" exercised by private parties and their LSPs.

This standard needs to be set so that PRPs and LSPs make reasonable and diligent decisions that will adequately address the issues at each site. There is certainly latitude for people to do more work than would be required by the standard (if they want more certainty for instance about how

widespread the contamination is). At the same time, response actions should generally meet this overall standard. If work falls below the standard, DEP and/or the LSP Board need to take action to ensure that corrections are made and that the problems do not recur.

In a traditional regulatory scheme where a state agency directly oversees response actions, the standard of care is simply what the agency requires. In the redesigned 21E program, many factors influence how LSPs and PRPs make these decisions, and shape and guide the quality of work. Figure 2-1 describes the factors which shape and guide the quality of work or standard of care that is applied by LSPs and PRPs. It is important to note that, while DEP and the LSP Board both have important roles to play in defining the standard of care for site cleanups, these agencies *influence* but do not *control* that standard.

The MCP establishes an overarching performance standard -- the Response Action Performance Standard (RAPS) -- which is "the level of diligence reasonably necessary to obtain the quantity and quality of information adequate" to assess and clean up a site. In addition to RAPS, there are more specific performance standards for key milestones. These are generally the standards used by DEP auditors in evaluating private sector response actions. However, the decisions made at a particular site about how to achieve these standards are affected by all the factors identified in Figure 2-1.

The documents describing response actions and LSP Opinions that are filed with DEP are the primary source of information about the level of care provided to an individual site. Specific documents are required by the MCP to be submitted to the agency. These submittals provide the starting point for DEP's audits (and other checks to see whether response actions comply with the regulations). They are also placed in DEP's files, where they are available for review by people considering purchasing the property or property nearby, lenders considering financing activities at the site, and by citizens concerned about environmental conditions in their neighborhood. All of these parties need to have confidence that the response actions they see documented in the file have adequately addressed the problems at individual sites.

As part of the program evaluation, DEP has reviewed site files and the results of the agency's checks for compliance with the MCP. This section summarizes the results of this review and presents some options for improving the overall quality of private sector response actions where needed.

How does DEP monitor private sector response actions?

DEP performs a variety of activities to ensure that the private sector is properly identifying and addressing releases and threats of releases of oil and hazardous material:

- Screening and reviewing submittals: PRPs are required to submit documents to DEP describing what they have done at key points in the cleanup process, which allows DEP to monitor the progress at these sites. DEP regional offices screen a portion of these submittals to identify situations that may pose potential problems. Some regions screen

nearly all key submittals (e.g., Tier Classifications, and submittals that close out sites such as Response Action Outcome Statements).

- Audits: Audits are performed for two purposes -- 1) to identify and correct inadequate response actions (via *targeted audits*), and 2) to verify general compliance with the MCP and to generally ensure that private sector response actions are adequate across all sites (via *random audits*).

- Compliance inspections: These inspections are currently performed outside the formal audit process to ensure that adequate response actions are taking place.

- Investigating complaints: As in all other DEP programs, DEP's Bureau of Waste Site Cleanup (BWSC) receives complaints from local officials, citizens, and other concerned parties. These can be the basis for an assessment of compliance status and possibly enforcement action.

- Scanning data and generating reports to monitor trends and patterns of noncompliance.

Of these, the best sources of information about the quality of private sector work are DEP audits and compliance inspections.

Audit Results

Audits are formal "after the fact" evaluations of response actions designed to determine whether the actions complied with the MCP, and if not what corrective steps are needed. When conducting an audit, DEP informs the PRP of the start of the investigation (via a "Notice of Audit") and closes it with a "Notice of Audit Findings." This process usually entails a review of site documents submitted to DEP (e.g., a Phase II report, a Response Action Outcome Statement, etc.) and a site inspection. Audits note both violations (where specific regulatory requirements were clearly not met) and deficiencies (where a response action is not carried out in accordance with an applicable performance standard or level of care). The process DEP has designed to conduct these audits is described in more detail in Chapter 3, with a summary of recommendations for improvements. This section focuses on audit results, and their indications for the overall quality of private sector work on site cleanups.

Table 2-1 shows that most audits have focused on response actions conducted in the first year after the site is reported to DEP (i.e., prior to Tier Classification). This is where the heaviest volume of work is conducted (i.e., 65% of all releases are cleaned up within the first year). DEP is now focusing more audits on Tier Classified sites.

TABLE 2-1: Types of Submittals/Sites Audited (as of 12/31/97)

	Total	Preclassification	Tier IB	Tier IC	Tier II

RAO[6]	592	526	1	3	62
RAM	101	62	0	1	38
TC[7]	11	0	3	1	7
DPS	32	27	2	0	3

Table 2-2 summarizes the findings of DEP's audits of response actions conducted in the redesigned 21E program. Frequently, problems identified during an audit are fixed by the time the audit is complete and a "Notice of Audit Finding" is issued. Problems that remain unaddressed (both deficiencies and violations) are noted in Notices of Audit Findings, and plans for followup work are required. Most frequently, followup work requires improving the documentation of work performed at the site. More substantial followup includes additional field work at the site (confirmatory sampling and/or more complete delineation of the extent of contamination) which is required where appropriate.

Table 2-2
Audit Findings as of 3/31/98

	Percent of Total (626)	Random Audits (228)	Targeted Audits (398)
Audits that found deficiencies [8]	56%	51%	59%
Audits that found violations	48%	49%	48%
Post-Audit Follow-up not required	70%	74%	67%
Post-Audit Follow-up required field work, reclassification, or RAO retraction	30%	26%	33%

About half of all audits find deficiencies, violations or both. The vast majority of these involve paperwork problems where documents were not submitted to DEP or where the submittal did not sufficiently describe the response action or thought process behind cleanup decisions. In most of these cases, audits show that, in fact risks from contamination have been eliminated adequately. However, audits show that the documentation is frequently not sufficient for the needs of the various parties who need to rely on that record. While this kind of problem does not affect the level of environmental protection that the redesigned 21E program provides (since the response actions are substantively adequate), it points to a major problem with the level of confidence that various stakeholders have in the privatized program.

Table 2-3 shows that more than two-thirds of the audits reviewed (70%) indicate that response actions are adequate in terms of the level of environmental protection that has been achieved. In 30% of audits, additional field work has been found to be needed to correct violations or deficiencies. Table 2-4

[6] 39 RAOs included AULs. RAOs may have been the result of an assessment, an IRA, a RAM, or other response action. Please note that the values for each of the designated categories are not mutually exclusive.
[7] Tier Classification Submittal, including Phase I Report and Numerical Ranking System Scoresheet.
[8] Overlap exists between deficiencies and violations; some sites had both deficiencies and violations.

shows the results of this additional field work, in terms of whether the additional work confirmed the original LSP opinion or resulted in a change in that opinion. The results of 228 audits at sites selected "randomly" for an audit show:

- 169 were deemed adequate and did not require further field work (a 74% initial compliance rate;
- 59 cases resulted in the need for further field work (26%). This work often included confirmatory sampling or sampling in previously unaddressed portions of the site to delineate the contaminated area with greater precision.
- Of the 59 cases where more field work was required, it has been completed at 52 sites, with these results:
  - 23 cases confirmed the original LSP opinion (44% of the cases where additional field work was completed).
  - 15 cases resulted in modification of the LSP opinion (29%),
  - 14 cases resulted in rejection of the LSP opinion (27%),

The 29 cases where the LSP Opinion had to be modified or retracted translates into 13% of the sites selected for random audits. Thus, for 87% of the sites selected for a random audit, the LSP's Opinion was found to be valid in the end.[9] In the case of targeted audits, 86% selected found the LSP Opinion to be valid in the end.[10]

Table 2-3
Audit Results and Need for Additional Field Work

	Total Audits	Adequate (No Further Work Required)	Further Field Work Necessary
Random	**228**	**74% (169)**	**26% (59)**
Targeted	**398**	**67% (266)**	**33%(132)**

Table 2-4
Results of Audits with Follow-up Field Work

	Total Sites Audited w/ Completed Field Work	Work Confirmed LSP Opinion	Work Modified LSP Opinion (% of Total)	Work Caused Rejection of LSP Opinion (% of Total)

[9] At 7 sites where further field work was required, the work has not yet been finished; the results of this work may affect the 87%.
[10] At 26 sites where further field work was required, the work has not yet been finished; the results of this work may affect the 86%.

Random	**52**	**44%(23)**	**7%(15)**	**6%(14)**
Targeted	**106**	**49% (52)**	**9% (36)**	**5% (18)**

To determine what violations and deficiencies were most commonly being found, DEP reviewed the Notices of Audit Findings (NOAFs) issued between July 1995 and December 1997, and Notices of Noncompliance (NONs) and Administrative Consent Orders with Penalties (ACOPs) issued between January 1996 and December 1997. The agency also reviewed reports from compliance inspections focusing on sites where remedial treatment systems were supposed to be operating, to identify trends in non-compliance with MCP requirements for operation and maintenance of these systems.

Table 2-5 reports the frequency with which audits found specific violations and deficiencies, by MCP section (i.e., Subpart of the regulations) and subject area. The most frequently encountered problem (considering both violations and deficiencies) involved inadequate characterization of the site (found in 539 of the citations; please note that many audits include multiple citations). This encompasses a wide variety of problems, including failing to adequately define all the types of contamination present and their extent, failing to adequately assess pathways for exposure, and not delineating the area that the response actions addressed. In some of these cases, investigations did not address significant aspects of the contamination -- these were generally noted as violations. In other cases, these issues were considered but the results of the analysis were not documented (these situations were generally categorized as deficiencies).

The second type of problem frequently found was missing or inadequate documentation for response actions. In some cases, appropriate Plans were not developed or implemented according to specific approvals (these were generally noted as violations) or the submitted Plans, Status Reports and Completion Statements were significantly incomplete (these were noted as deficiencies). DEP found 276 citations (considering both violations and deficiencies) involving inadequate or incomplete documentation.

Table 2-5: NOAF Review Results

Violation Summary

MCP Subpart	Violation	Number	% Total (448)
A	BOL submitted late/not correct copy	79	18 %
B	Did not meet Interim Deadline	21	5 %
B	Did not meet RAPS	11	2 %
C	RNF submitted late/No RNF submitted	52	12 %
D	IRA Plan / IRA Status Report / RAM Status Report not submitted by deadline	135	30 %
I	Did not adequately define vertical & horizontal extent of contamination; GW not properly classified; cleanup standards not properly used	68	15 %
J	Condition of No Significant Risk not achieved; area for which RAO applies not clearly and accurately identified	99	22 %
N	No documentation that local officials were notified of DEP submittal	65	15 %

Deficiency Summary

MCP Subpart	Deficiency	Number	% Total (448)
A	Analytical data not sufficiently accurate and precise; chain of custody documentation lacking	35	8 %
B	DPS Opinion failed to fully investigate possible source; DPS boundaries not clearly defined	13	3 %
B	RAPS level of diligence; RAPS consideration of all relevant guidance and policies	20	5 %
C	LRA conducted in error; notification retraction not accurate	11	2 %
D	Inadequate assessment/documentation; incomplete IRAP/ IRAC/Status Report	52	12 %
F	LSP Eval Opinion did not address all OHM; inadequate documentation	12	4 %
H	Did not delineate extent of soil/GW contamination; background levels of OHM not properly determined; permanent solution has not been demonstrated	26	6 %
I	Horizontal and vertical extent of contamination not sufficiently defined; did not assess potential exposure pathways; did not adequately categorize GW at site	116	29 %
J	Boundaries of disposal site not clearly delineated in RAO; inadequate assessment; inadequate documentation (eg. missing monitoring well data , receptor identification)	105	23 %
N	No documentation that local officials were notified of DEP submittal	7	2 %
O	Inadequate technical justification for eliminating exposure pathways or subtracting points	22	5 %

Enforcement Results

Generally, when DEP finds that response actions have not been performed or clearly violate one or more provisions of the MCP, it directs enforcement action against the person who is legally responsible for ensuring that the site is appropriately cleaned up (i.e., the PRP). DEP has issued a total of 1375 Notices of Noncompliance (NONs) since the new program started operation, and 78 Consent Orders (including both Administrative Consent Orders and Unilateral Consent Orders). NONs cite specific instances of noncompliance with the MCP, and require followup work to be performed on a specific schedule. Consent Orders generally require remedial work on a specific schedule, and sometimes also require payment of administrative penalties.

The vast majority of these enforcement actions have cited failure to notify DEP of a release or failure to take appropriate action once the release was reported. Adverse audit findings have accounted for 101 (7%) of the Notices of Noncompliance issued. Where enforcement actions have focused on inadequate LSP Opinions, DEP understands that these PRPs have in many cases either asked their LSPs to correct the problem (sometimes at no additional cost) or have hired new LSPs.

In general, when DEP believes that an LSP's work does not appear to meet the LSP Board's professional conduct standards, the agency files a complaint with the LSP Board, rather than taking direct enforcement action against the LSP (The results of these referrals are discussed in Chapter 9 of this Report, with the Board's evaluation of its component of the Waste Site Cleanup Program). However, in a handful of cases, DEP has issued enforcement actions directly against an LSP. These actions have been taken where the LSP was found to have performed work that requires DEP approval without obtaining the agency's signoff, or making conditions at a site worse.

For this evaluation, DEP reviewed 309 NONs and 30 Administrative Consent Orders with Penalties (ACOPs) issued in fiscal years 1996-7 that were not based on audit findings. This review found that most of the violations cited in documents reviewed (86%) involved failure to notify DEP of a release within a required timeframe, or to follow comply with the MCP after the site was reported. 134 of the 587 violations cited (23%) in the documents reviewed were problems with notification requirements (Subpart C of the MCP). Another 185 violations (32%) were problems with procedural requirements for preliminary response actions (IRAs and RAMs, in Subpart D of the MCP). Six percent of the violations (31 of 520) dealt with inadequate assessments, improper use of risk characterization methods (Methods 1 and 2), failure to meet the performance standards for a Response Action Outcome, and improper use of the Numerical Ranking System to tier classify a site. Another 8% of the violations cited in NONs reviewed involved improper management of wastes from remediation (28 violations of contaminated soil requirements, 9 violations of requirements for managing remedial wastewater, and 4 violations of requirements for controlling air discharges from remedial systems).

These enforcement actions reflect DEP's enforcement focus on failing to notify and to follow MCP requirements at sites where some response actions have occurred. In general, these enforcement actions document situations where a commitment to seeing the site cleanup through

to the end is lacking. However, the lack of commitment can stem from a PRP's lack of resources or unwillingness to pay for required work, as well as bad decisions by an LSP.

Results of Compliance Inspections of Remedial Treatment Systems

DEP reviewed status reports concerning operation and maintenance of remedial treatment systems (e.g., systems pumping and treating contaminated groundwater) at more than 220 sites, and also conducted 34 compliance inspections to see how systems that were supposed to be "active" were working (problems with late submittals of status reports were not addressed).

Of the 220 site status reports evaluated, 133 (70%) appeared to be in compliance with the MCP requirements, while 55 (30%), appeared to be out of compliance. However, the longer the treatment system had been in operation, the higher the likelihood that it appeared to be out of compliance. For the sites for which more than one status report had been submitted (indicating that the treatment system had been running for more than one year (95 sites), 55 (79%) were not complying with requirements. Potential violations and/or deficiencies of the MCP requirements included the lack or insufficiency of air emission controls, inappropriate discharges of contaminated water to groundwater and surface water, treatment system malfunctions and other operational problems, and lack of monitoring data.

Of the 34 treatment systems that were inspected for this evaluation, 10 (30%) were found to be in compliance with MCP requirements, while 24 sites (70%) were found to be apparently out of compliance. In many of these cases, the DEP inspection found that the carbon filter had been replaced just prior to the inspection (these inspections were announced ahead of time), or that needed parts for the system were on order, or had been recently replaced and the system was being tested. In several instances the systems had been shut down without the required notification to DEP. In some of these cases the PRP decided that he or she had met the remedial goals for the site, and was anticipating being able to file a Response Action Outcome Statement. In other cases, the PRP was considering another remedial strategy, but had stopped operating the system while this evaluation was being conducted.

Stakeholder Comments

The problems identified above have led to a significant lack of confidence in the privatized program on the part of many program stakeholders. While this lack of confidence may not reflect serious substantive problems with private sector response actions that are not overseen directly by DEP, it is in itself a serious hindrance to the program's success, since stakeholders may not be willing to rely on the private sector opinions and documents.

How would you describe the standard of care (i.e., quality of work) exercised by LSPs?

	Reasonable	**Too conservative**	**Careless**	**Unsure**
DEP Staff	46%	2%	47%	5%
LSPs	76%	11%	4%	9%
Consultants	68%	11%	3%	18%
Citizens	41%	15%	35%	8%
Health agent	80%	4%	10%	6%
Lender	87%	6%	0%	7%

DEP staff have indicated that, while many PRPs and LSPs are very diligent, others

take a “catch me if you can” approach because they see a low probability of getting audited in the current program. The nature of performance standards has in some ways made DEP’s compliance and enforcement job harder than it was in a “command and control” program, since specific requirements are not spelled out, and there have been many disputes between DEP and LSPs as to whether the work performed actually met the performance standard. These disagreements often come down to differences in professional opinion, where the information needed to resolve disagreements is not available (e.g., more samples are needed to determine whether groundwater contamination has been cleaned up or whether it has just moved off the property). Obtaining this information represents an additional cost for PRPs, which they had not planned on. When response actions are merely inadequate (as opposed to violating a specific requirement of the MCP), it is difficult and time consuming to convince PRPs and their LSPs that they need to do more.

Inadequate documentation is also a problem for DEP staff, since they need to interpret the data as part of an audit. Poorly organized and incomplete reports take longer for staff to review than well-presented reports.

The scope of assessments is frequently determined by the PRP’s budget. Competition for business among LSPs is currently very intense, and can lead LSP’s basing an opinion on only the work that the PRP is willing to pay for without considering other work that DEP would require. A number of LSPs said they feel caught between what the MCP requires and what their clients are willing to pay for. PRPs may not want to pay for investigations of contamination migrating onto other people’s property, partly due to the expense, and partly due to the potential exposure for lawsuits by neighboring owners.

PRPs report that the competence of LSPs varies considerably, and appears to be based primarily on the LSP’s experience. Large consulting firms generally provide some kind of peer review of staff work (which is designed to catch problems before submittals are made to clients or the agency). Smaller firms and individual practices may not be able to provide this service. A number of respondents believe that the LSP Board needs to take a more publicly visible role in imposing disciplinary action for sloppy and inadequate work, and in weeding out LSPs who are not competent to practice.

A number of stakeholders have indicated that LSPs and response action contractors should be more directly accountable for the quality of their work than they are currently. Concern has been expressed that there appears to be little or no consequence for inadequate work, and many PRPs (particularly those with only one site and/or little technical knowledge of their own) rely substantially on their LSPs’ professional judgment. Some LSPs believe that their profession is hurt by the relatively few practitioners who do not perform adequately and who are not held accountable.

Many PRPs and citizens reported that they did not know about the Board’s process for investigating complaints about inadequate work. At the same time, some PRPs may be reluctant to file complaints with the Board because this could draw DEP’s attention to the inadequate work at their site and possible enforcement action against them by DEP. Some people who call the

Board decline to file formal complaints for investigation when they find out that the Board cannot award monetary damages to them.

Options for Improvements:

1. Better definition of key performance standards

Some MCP performance standards could be made more explicit. These may include:

- Documentation requirements for supporting response action decisions. Areas to review include Phase 1 and Phase 2 submittals (to get better definition of the horizontal and vertical extent of contamination, exposure assessments, etc.), RAOs, analytical procedures (including QA/QC data such as surrogate recovery, method modifications, QA/QC acceptance standards, etc.).

- Continued development of guidance, particularly related to the design of sampling plans and use of analytical results (e.g., selecting *where* to sample, *how many* samples to take, and how to *average* that data for comparison to appropriate standards based upon contaminant types, migration pathways, site homogeneity, and receptors; and sample averaging that considers mass/volume of contamination, as well as exposure pathways).

- Continue DEP efforts to provide training to LSPs and other interested parties on new policy and regulation developments.

- Add a requirement to the Response Action Performance Standard (RAPS) in the MCP to require the development and presentation of a "conceptual site model" during Phase II assessments. This model would describe the entire site, and would include the location of contamination, exposure point concentrations, receptors, and how this picture can be expected to change over time. A model would require accurate and adequately comprehensive data, and presentation of that data in terms of space and time, and would provide a framework against which the effectiveness of alternative remedies can be evaluated in Phase III of the response action.

2. More accountability for private sector decisions

As noted above, when DEP finds inadequate work, it directs most enforcement actions against the PRP (if needed) by issuing NONs and ACOPs, since these are the parties who are legally responsible for addressing contamination appropriately. DEP plans to continue its current practice of filing complaints about LSP work with the LSP Board where the work does not appear to meet the Board's professional conduct standards. DEP also plans to continue to support the Board in its investigations of complaints by making its files available and providing technical assistance to Board staff and members.

In addition, DEP is considering the following:

- expanding the universe of problems for which it would take enforcement action directly against a response action contractor or LSP, particularly where work appears to have been performed in contradiction to a specific DEP approval (e.g., excavation of substantially more contaminated soil than what was approved for an IRA or RAM Plan), and where an LSP Opinion says that work was performed in accordance with DEP's approval when it in fact did not conform.

- making Notices of Audit Findings and enforcement documents more accessible to the public. Since the start of the redesigned program, audit findings have been publicly available in each of DEP's offices, but these documents are available only in large binders in hard copy. They are not sorted by types of findings, PRP or LSP, and are only available during business hours, which is inconvenient for many people. Notices of Audit Findings could be made available via DEP's Web page in a format that can be easily searched, and would enable any PRP or citizen with access to a computer with a modem to track the records of both PRPs and LSPs.

3. Increased DEP Field Presence

DEP spends a significant amount of time reviewing and approving remedial actions as part of front-end risk reduction activities, and at permitted sites. The results of DEP's review of the operation and maintenance of remedial systems described above is not encouraging, since it shows that a majority of these systems are not being operated or maintained properly. DEP needs to expand its present field compliance inspection program to ensure approved remedial systems are operating properly and are maintained. The recommendations for improving DEP's audit program, particularly those dealing with the creation of "unannounced audits" would be particularly helpful for this type of problem. These are described in Chapter 3 below.

CHAPTER 3: IS DEP FOCUSING WHERE IT SHOULD?

In the old program DEP did not have adequate resources to oversee the thousands of sites in the cleanup system and faced many external pressures to direct scarce resources to lower priority sites (e.g., to facilitate real estate transactions). One of the goals of the redesign was to allow DEP to focus its resources on sites posing the most serious risks and on other activities that government needs to do. These include:

- ensuring that spills and other emergencies are responded to quickly and appropriately (and therefore preventing most spills from becoming disposal sites requiring long-term assessment and further cleanup);

- overseeing the assessment and cleanup of the most serious sites (including Tier I permit reviews and direct oversight of Tier IA sites);

- using public money to directly assess and clean up high-risk sites where PRPs cannot or will not do the work;

- conducting site discovery activities to find those sites which pose the most serious threats;

- ensuring that private sector response actions are conducted appropriately by maintaining a strong compliance and enforcement program; and

- establishing clear standards and guidelines for conducting response actions.

In the new program DEP directly oversees responses for imminent hazards and other time critical conditions such as sudden releases (Immediate Response Actions or IRAs), and early voluntary responses before much is known about the site (Release Abatement Measures or RAMs). DEP also directly oversees long-term cleanups of the worst and most complicated sites (Tier IA sites). Sites classified as Tier IB or IC receive an initial review via a permit (to make sure that they are receiving an appropriate level of oversight), but in general further response actions are overseen by LSPs. At Tier II sites (sites that pose the lowest risks), all response actions (including Tier Classification) are overseen by LSPs. At sites where PRPs do not conduct necessary response actions, DEP uses compliance and enforcement strategies to get PRPs to meet their cleanup obligations, and may spend public funds to deal with time-critical situations. Where DEP spends public funds, the agency uses every available tool to recover its costs from responsible parties.

As shown in Chapter 1, the majority of sites that require comprehensive response actions are classified as Tier II. In general, response actions at sites posing the lowest levels of risk for health, safety, public welfare, and the environment are performed by the private sector without up-front DEP oversight. By largely getting out of the business of directly overseeing most cleanups, DEP has been able to shift staff resources from pre-cleanup approvals to focus on emergency response, cleanup of the worst sites, compliance monitoring, enforcement and site discovery.

Where DEP Is Focusing Its Resources

Approximately 74% of BWSC staff are devoted to program operations (i.e., working on specific releases). However, these staff do not spend 100% of their time on site work but perform other activities such as outreach, policy development, training, etc. Table 3-1 shows how staff have spent their time over the past six fiscal years. In FY97 approximately 54% percent of all time was charged to program activities related to direct site work (i.e., permitting, compliance, enforcement, and assessment and remediation).

Table 3-1
BWSC Full Time Equivalents (FTEs) by Fiscal Year

	FY92	FY92	FY93	FY93	FY94	FY94	FY95	FY95	FY96	FY96	FY97	FY97
Program Activity	**FTEs**	**% Total**	**FTEs**	**% Total**	**FTEs**	**% Total**	**FTEs**	**% Total**	**FTEs**	**% Total**	**FTEs**	**% Total**
Assessment & Remediation	63.1	42.5	74.2	43.3	89.6	43.5	76.9	38.7	77.4	38.2	73.9	37.0
Permitting	NA	NA	NA	NA	0.6	0.3	3.7	1.9	5.1	2.5	4.1	2.1
Compliance	NA	NA	NA	NA	2.9	1.4	10.8	5.5	14.2	7.0	21.8	10.9
Enforcement	0.7	0.5	0.7	0.4	1.2	0.6	4.3	2.2	6.1	3.0	7.1	3.6
Grants	0.0	0.0	0.0	0.0	0.2	0.1	1.0	0.5	0.7	0.4	1.4	0.7
Technical Assistance	5.2	3.5	5.6	3.3	7.5	3.6	7.6	3.8	8.5	4.2	8.7	4.3
Program Development	13.2	8.9	18.1	10.5	20.6	10.0	20.2	10.2	24.2	12.0	36.3	18.2
Basic Research	0.3	0.2	0.1	0.0	0.5	0.3	0.2	0.1	0.4	0.2	1.2	0.6
General Administration	48.3	32.6	54.2	31.6	64.0	31.1	55.6	28.0	46.8	23.1	39.1	19.6
Clerical	8.6	5.8	9.2	5.3	9.5	4.6	9.3	4.7	5.6	2.7	NA	NA
Data management	6.1	4.1	6.4	3.7	5.2	2.5	4.9	2.5	9.0	4.4	NA	NA
Revenue	3.0	2.0	3.0	1.8	4.2	2.0	3.9	2.0	4.3	2.1	5.9	2.9
Total FTEs	148.4	66.4	171.5	67.3	206.1	56.5	198.5	61.3	202.4	61.8	199.6	63.0

Table 3-1 Notes:
-- 1 FTE = 220 days
-- FTEs are for BWSC staff only; does not include time spent on waste site cleanup activities by other offices (e.g., DEP's Office of Research and Standards, Office of General Counsel)
-- Program development includes program planning, development, implementation and evaluation; development of policies and regulations; program coordination (e.g., with advisory committees, other agencies), and training.
-- Permitting and Compliance were added in FY94
-- Clerical and data management were moved to General Administration in FY97

Overall, the allocation of DEP staff time reflects the goals of the redesigned program:

- Assessment and Remediation activities (e.g., time spent on site discovery, emergency response, oversight of the most serious sites) have increased in terms of FTEs (from 63.1 FTEs in FY92 to 73.9 FTEs in FY97), but, as expected, have decreased as a percentage due to the need for staff to devote time to the elements of the program that were new in FY94 (i.e., compliance/audits and permits).

- Compliance activities have steadily increased as more resources have been devoted to screening LSP submittals, conducting audits and inspections, promoting compliance, and

enforcement has increased as staff have been freed up to address violations of the MCP and sites where PRPs are not conducting response actions; and

- Program development activities have increased as a percentage as more time has been spent on developing policies and guidelines for the new program, resolving program implementation issues, and developing a brownfields strategy[11].

Table 3-2 shows staff time spent on specific sites. For site-specific time, the allocation of DEP staff time again reflects the goals of the redesigned program. Taking FY97 as an example:

- 63% of all site-specific time was devoted to Tier I sites, with the largest portion of Tier I time devoted to Tier IA sites (84%),
- 16% of time was devoted to responding to spills and other serious site conditions requiring immediate responses, and
- A significant amount of oversight, compliance and enforcement time was devoted to ensuring that private sector responses are done in compliance with the MCP (Tier II and "Other" category), the majority of which focused on the "Front End" of the program where most risk reduction and cleanup activities occur (e.g., on average 60% of all releases are cleaned up within one year).

Table 3-2
FTEs Devoted to Specific Types of Sites

	FY92		FY93		FY94		FY95		FY96		FY97	
STATUS	**FTEs**	%	**FTEs**	**%**	**FTEs**	**%**	**FTEs**	**%**	**FTEs**	**%**	**FTEs**	**%**
TIER IA	25.2	47%	32.9	48%	43.6	50%	43.0	52%	39.1	49%	40.7	53%
TIER IB	3.5	7%	3.8	5%	4.0	5%	3.5	4%	2.6	3%	5.0	7%
TIER IC	0.6	1%	0.6	1%	1.2	1%	2.5	3%	2.2	3%	2.6	3%
TOTAL TIER I	29.3	54%	37.2	54%	48.8	56%	49.0	59%	44.0	55%	48.2	63%
							0.0					
TIER II	5.6	10%	6.1	9%	11.5	13%	8.6	10%	7.1	9%	6.3	8%
ER (preclassified)	11.6	21%	14.1	20%	12.6	15%	13.7	16%	15.2	19%	12.4	16%
Other (preclassified)	7.7	14%	11.6	17%	13.7	16%	11.8	14%	13.4	17%	9.5	12%
TOTAL	54.1		69.0		86.6		83.2		79.7	1.0	76.3	

Table 3-2 Notes:

-- This data reflects time where a Release Tracking Number was recorded on a BWSC employee timesheet, regardless of timecode used (e.g., assessment and remediation, compliance, enforcement, permitting, etc.). In general, timesheet data underestimates actual time spent on sites, since an RTN is usually not used for management and supervisory time.

-- "Status" is based on a site's current status. A site may have had a different status in past fiscal years. For example, a site currently classified as a Tier IB site will appear as Tier IB in all fiscal years, even though the status "Tier IB" did not exist prior to FY94.

-- "Other" includes audits, inspections, enforcement, assessment and remediation, etc.

Types of Sites DEP Focuses On

[11] Please note that part of the increase in FY97 is due to moving time spent by staff in training from General Administration to Program Development that year

Section 3A(p) of c. 21E states that DEP's highest priority must be to ensure progress at sites which pose the greatest risk to health, safety, public welfare, and the environment. To achieve this goal, this section requires DEP, at a minimum, to ensure each year that response actions start at 100 sites which are among those that pose the greatest risk, and to identify 100 sites at which DEP will ensure that permanent solutions (or temporary solutions if permanent solutions are not feasible) are reached within 5 years.

DEP has wrestled with a definition for a "worst" site. To many stakeholders, the "worst" sites are those classified as Tier IA sites. While it is true that many Tier IA sites pose high potential risks to health and the environment, a number of Tier IA sites currently pose relatively minor risks but are classified as Tier IA because they are technically complex and/or because multiple PRPs are involved and DEP oversight is needed to prevent these sites from becoming a high risk if not properly handled. There are also a number of "preclassified" sites that should be considered among the worst, most notably those resulting from large spills, chemical fires, and other emergencies. These releases may be cleaned up in a relatively short period of time, but pose serious hazards if not addressed. DEP believes that these clearly fall within the intent of the statute to focus on those sites that "pose the greatest risk." Finally, DEP spends a significant amount of time on sites that may not pose high risks but which are part of major public projects (e.g., the Central Artery/Third Harbor Tunnel), have significant public concern or controversy, or have unique compliance issues. The following list summarizes the categories of sites where DEP focuses its resources:

- Sites with high potential risk for public health and the environment (i.e., "worst sites")
  - Tier IA (i.e., large, complex sites with potential exposures to sensitive receptors)
  - Publicly funded sites where serious risks were not being addressed by PRPs (most are Tier IA but some have not been classified)
  - Other high-risk sites (i.e., large spills, emergencies, and releases that, if not quickly addressed, will spread to nearby sensitive receptors)
- Tier IB and IC sites (DEP issues permits but does not directly oversee these sites)
- Sites that are part of significant public projects
- Sites with significant public concern/controversy
- Sites in noncompliance where delays may exacerbate conditions/create risks or where the lack of any action by the PRP means that the risks posed by the site are unknown.

While DEP has been ensuring that response actions are conducted at the sites that pose the greatest risks, to date the agency has not published a list to demonstrate compliance with this provision of c. 21E. DEP is planning to identify sites meeting the "100 sites" criteria since the redesigned program started in conjunction with the publication of the next *List of Tier I Disposal Sites* scheduled for Fall 1998. Sites in the first two categories above will be included. This list will identify at least 600 Tier I sites which have been placed on a five-year schedule to achieve a temporary or permanent cleanup. Future Tier I Site Lists will identify additional sites annually where actions have been taken in accordance with Section 3A(p).

Tier IA sites

While DEP believes that Tier IA sites are only part of the picture in terms of "worst" sites, they are a significant part of DEP's focus and warrant special analysis.

DEP has been able to increase its focus on Tier IA sites by downgrading the ones which no longer need DEP oversight. When the new 21E program took effect, 537 sites classified as "priority" sites under the old rules were automatically classified as Tier IA under the new MCP. By issuing lower-category Transition Permits where appropriate, and allowing PRPs to voluntarily score their sites using the Numerical Ranking System into a lower Tier category, more than 200 of these sites were allowed to proceed with response actions without direct DEP involvement, allowing the agency to concentrate on cleanups at the remaining higher-risk and/or complicated sites. In addition, 68 sites classified as "priority" in the old program were able to achieve an RAO using the new program (as compared to only 3 priority site cleanups in the last five years of the old program).

As the data in Table 3-2 above shows, time spent on Tier IA sites in FY97 increased 62% since FY92 (40.7 FTEs versus 25.2 FTEs). Since FY92, DEP has increased the staff in the Waste Site Cleanup Program by 34% (see Table 3-1 above). Staff time devoted to Tier IA sites has grown at a greater rate (62%) over this period, which clearly indicates that DEP is today focusing more resources on Tier IA sites than in the old program.

Time spent on Tier IA sites peaked in FY94 and since then has decreased by 7%. DEP believes this is because in FY94 and FY95 the agency devoted substantial resources to issuing Transition Permits to sites classified as "priority" under the old rules, and bringing them in the new program. These Permits indicated whether DEP believed a site should remain a Tier IA or be reclassified as Tier IB. Time spent to develop Transition Permits was in addition to time spent on oversight of response actions, thus accounting for the increased level in these two fiscal years. By the beginning of FY96 this effort had been completed, with a corresponding decrease in time spent.

The redesigned program has led to more cleanup of Tier IA sites. Of the 68 cleaned up sites which started as Tier IA sites in the new program, nine of these were still classified as Tier IA when an RAO was filed. DEP has also increased resources devoted to Tier IA sites so that many are completing work at a more rapid pace than under the old program. However, there are a number of areas where improvements are needed:

- Of the 269 Tier IA sites, 23 do not have a DEP staff person assigned to oversee response actions;
- Some DEP Tier IA project managers are overseeing up to 10 sites, which is more than can be effectively managed without delays;
- Due to resource constraints, staff tend to focus on those Tier IA sites where PRPs want to move forward (and thus are generating assessment and cleanup plans that must be

Table 3-3
Tier IA Statistics

Total: 269
264 Transition (76 on NPL)
5 New

Current Phase		Risk Reduction	
I	96	IRAs	90
II	100	RAMs	75
III	36		
IV	34		
V	3		

reviewed and approved), and have limited time to take proactive steps, including enforcement, to push PRPs who are "dragging their feet";

- As a result, 73% of Tier IA sites have not yet completed a Phase II assessment and 121 sites have had little or no forward progress through the MCP phases during the past four years.

Options:

- Increase the number of Tier IA site managers, risk assessors, and legal support to move Tier IA sites forward; improve training of site managers to increase efficiency and effectiveness of oversight.

- Increase DEP's focus on PRPs who are not moving forward; where necessary, increase enforcement against PRPs who will not move forward in a timely manner.

- Include compliance information on the annual Tier I Site List to show which Tier IA sites are not moving expeditiously with cleanup.

- Identify incentives to encourage cleanup and reduce costs (e.g., innovative technologies, brownfields redevelopment opportunities).

- Use the newly-created Site Management Section in the Boston Office to explore ways to increase efficiency and effectiveness and better coordinate site management activities statewide.

Tier Classification

The MCP's Tier Classification process is an important determinant of the sites DEP works on. The intent of the system was to identify those sites which require some level of DEP oversight due to their complexity and/or risks they pose. In the current program, releases not permanently cleaned up within one year must be scored using the MCP's Numerical Ranking System and classified as Tier I or Tier II to determine the subsequent level of DEP oversight. At a minimum, the score must be based on a Phase I site investigation. Tier II sites may proceed with cleanup without DEP involvement. For sites classified as Tier I, PRPs must obtain a permit from DEP to proceed with comprehensive response actions.

DEP originally estimated that 70% of sites would score as Tier II and 30% as Tier I. As Table 3-4 shows, 89% of sites have scored as Tier II, and less than 1% have scored as Tier IA. The fact that DEP's original estimate did not hold true does not necessarily imply that the cut-off scores between the various Tiers are set inappropriately; however DEP staff experience has shown that in fact there are a number of sites that legitimately scored as Tier II which have potential risks that could warrant direct DEP oversight (e.g., a site that has contaminated numerous private drinking water wells). Specific concerns include:

Table 3-4
Tier Classifications

Tier IA	11	<1%
Tier IB	43	2%
Tier IC	228[12]	9%
Tier II	2,325	89%
Total	*2,607*	

- sites with private well contamination do not score high enough to adequately address the importance of this exposure

- the hydrogeology section does not adequately address sites with contamination in bedrock or with other complex geology;

- the groundwater and surface water contamination scores are too low where exposure is likely or confirmed; and

- the NRS is too complicated for small homeowner heating oil spills that cannot be cleaned up within one year.

In addition, there have been some concerns that Phase I data is too preliminary to base the NRS score on and that PRPs and LSPs are not considering reclassification of sites where Phase II information indicates higher potential risks than Phase I information.

Options:

- Modify the NRS (Section IV) to address private drinking water well contamination sites with a score high enough to address the importance of this condition.

- Expand the NRS's Hydrogeology section to address bedrock and sites with complex geology.

- Increase the NRS's groundwater contamination score where exposure is likely or confirmed to address risk to all water supplies.

- Increase the NRS's surface water score in section II for likely or confirmed exposures.

[12] Eighty-nine Tier IC sites were classified as Tier IC because they triggered Tier I inclusionary criteria (e.g., groundwater contamination within a Zone II), and would otherwise have been classified as Tier II based solely on their numeric score.

- Add a requirement that the LSP provide an Opinion in the Phase II submittal as to whether site's Tier Classification should change based on new information.

- Allow for "NRS short forms" for homeowner fuel oil releases and potentially for other small releases that will not require comprehensive response actions.

- Provide a way for DEP to classify "orphan" sites, (especially where DEP is implementing risk reduction measures), even though a party willing to complete cleanup has not been identified.

It should be noted that increasing the number of Tier I sites, and particularly Tier IA sites, will also increase the amount of resources DEP must devote to Tier I permit reviews and oversight of Tier IA sites.

Tier I Permits

Through Tier I permitting, DEP has the opportunity to screen sites to determine which ones pose the greatest threats or are the most complex and therefore should receive direct oversight as Tier IA. Even where DEP agrees that a site should be Tier IB or IC but has specific concerns about what is needed at the site, DEP can establish special permit conditions to ensure that potential hazards are assessed and dealt with. Some DEP staff believe the Tier I permit process is very useful. However, a number of DEP staff as well as LSPs and PRPs have raised a number of concerns about the usefulness of Tier I permits. Issues identified include:

- whether a formal permit adds value at Tier I sites.

- the value of using the "major permit modification" process just to add a new PRP to a permit.

In addition to providing an opportunity to review sites that pose higher potential risks, Tier I permits are enforceable documents through which a PRP agrees to clean up on a specific schedule. DEP believes Tier I permits should be retained, but is considering the following changes:

- move the permit application point to the end of Phase III so DEP can review the proposed remedy. This will provide an incentive to PRPs to conduct risk reduction and get out of the system sooner to avoid permitting.

- Use a presumptive approval process for permit applications. Consider only requiring a permit for sites where the remedy will not achieve cleanup to unrestricted use.

- Provide a clear way for DEP to upgrade a site to Tier IA without going through the current permit modification process.

- Combine Tier IB and IC categories.

- Reconsider whether adding PRPs to permits could be accomplished through a minor permit modification rather than a major permit modification.

Publicly Funded Response Actions

DEP uses bond funds to conduct response actions at high-priority sites where PRPs are unable or unwilling to do so in a timely way. Funds are spent for both emergency responses (e.g., gasoline tanker truck accidents, chemical fires) and substantial hazards posed by waste sites (e.g., constructing and operating treatment systems to cleanup groundwater plumes threatening public or private wells, providing bottled water to residents whose drinking water wells have been contaminated). In addition, these funds are used to pay Massachusetts' share of response action costs at sites that are listed on the U.S. EPA's National Priority List (where the federal program currently requires states to pay for 10% of the costs of constructing remedies and all operations and maintenance costs).

When bond funds are spent, DEP seeks to recover its costs from responsible parties, including both contractor costs and agency oversight costs. The threat of state cleanup action has provided a powerful incentive for private parties to undertake response actions: since 1983, private parties have conducted assessments and cleanups at 97% of spills (or sudden releases), and at sites where longer term action is being taken, private parties have conducted the work at about 90% of these sites. Since the new program took effect, DEP has spent bond funds totaling $14.5 million at 398 different sites. Employing an aggressive mix of negotiations, mediated settlements and litigation, DEP collected $9.9 million from responsible parties in the same time period.

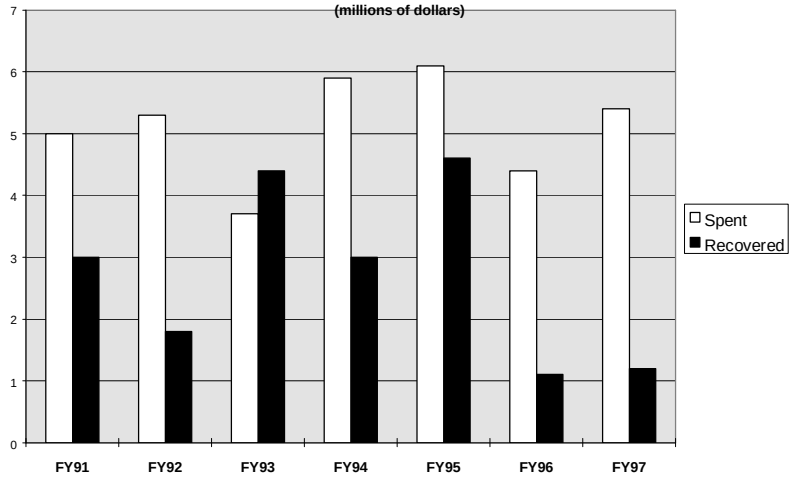
With the ability to focus on higher priority sites in the new program, DEP had anticipated spending more bond funds in the new program than in the old. This has not been the case due to the Commonwealth's cap on bond fund spending. As of 7/1/97, DEP had $86.3 million remaining from a 1995 authorization of $100 million. However DEP was limited to a spending cap of $6.7 million in FY98.

Table 3-5
Bond Fund Expenditures for Specific Sites
millions of dollars

	FY91	FY92	FY93	FY94	FY95	FY96	FY97	
ER/Risk Reduction	$2.4	$2.0	$1.5	$2.1	$2.3	$1.1	$1.3	
Site Assessment	$2.5	$2.1	$2.2	$1.9	$2.1	$1.0	$1.0	
Phase IV Construction	$0.1	$0.2	$0	$0.8	$0.4	$0.5	$0	
Match for NPL Sites	$0	$1.0	$0	$1.1	$1.3	$1.8	$3.1	
Total	$5.0	$5.3	$3.7	$5.9	$6.1	$4.4	$5.4	

In terms of trends, there has been an increase in payments to EPA as Massachusetts obligations have come due, leaving less money available for other activities. DEP's bond fund spending "cap" does not provide enough money to address sites which DEP believes cleanups should be publicly funded. Excluding EPA match funds, there has been an increase in spending for emergency response and risk reduction measures in the new program and decreased spending for preliminary assessments and site assessments. This trend is primarily due to the bond fund spending cap. With limited capital funds available, DEP must devote resources first to emergencies and risk reduction. Once a site is stabilized, there is often not enough resources to do further assessment and comprehensive cleanup even if there are no viable PRPs.

Figure 3-1
Bond Funds Spent on Sites and Recovered
(millions of dollars)



Massachusetts currently has bills from EPA that exceed the annual spending cap. While negotiations with EPA have brought some relief from deadlines for payment, DEP suggests increasing the spending cap for the 21E bond funds to cover these bills.

Site Discovery

One of the criticisms of the old cleanup program was that DEP had not been able to implement a comprehensive site discovery program. Chapter 21E requires property owners and other responsible parties to notify DEP of contamination they find, but does not obligate them to look for it. Many site investigations are performed as a condition of refinancing or of obtaining new financing for a real estate transaction. Otherwise, many property owners feel they have no reason to perform environmental testing, and may not want to know about problems. As a result, DEP may not find out about the worst sites if it relies only on voluntary reporting.

One of the goals of the program redesign was to free up DEP staff to focus on the worst sites, which includes finding them. The Study Committee that helped DEP redesign the program recommended that the agency develop an aggressive site discovery program to identify contamination in areas where it could cause great harm (e.g. near public water supplies, or in densely populated urban communities that are surrounded by industry).

Section 3A(c) of the 1992 Amendments to Chapter 21E directs DEP to continuously carry out a comprehensive program to

> "identify sites in the Commonwealth, with particular emphasis on sites that pose a substantial hazard. Such program shall ensure that sufficient sites are discovered to enable the department to meet the requirements of subsection

(p). [i.e., start actions on 100 of the worst sites each year] By January first, nineteen hundred and ninety-four, the department shall publish a three-year plan which establishes a schedule of site discovery activities to identify, at a minimum, significant threats to public water supplies. No later than January first, nineteen hundred and ninety-seven, the department shall identify and list, pursuant to subsection (b), [i.e., publication of the Tier I site list] sites which pose a significant threat to public water supplies."

In 1994 DEP published the required Site Discovery Plan, and continued pilot site discovery programs in each of its four regional offices. The Site Discovery Plan laid out a process for conducting site discovery investigations that could be tailored by regional offices based on region-specific factors. DEP has not yet published a list of sites which pose significant threats to public water supplies, but will identify such sites in the List of Tier I Disposal Sites that will be published in Fall 1998.

As directed by the statute, DEP has focused site discovery investigations primarily on public water supplies affected by contamination from unknown sources. Site Discovery personnel, in close cooperation with DEP's Division of Water Supply (DWS), have screened more than 250 community public water supply systems, identified supplies with detectable levels of volatile organic compounds (VOCs), and prioritized these for site discovery investigations based on the number of people served, vulnerability of each source, and other factors.

Regional Site Discovery Programs

Each of DEP's regions have taken different approaches to site discovery, which are described below:

DEP's Northeast Regional Office (NERO) covers the most populated and industrialized region in the state. NERO has two full-time employees assigned to the Site Discovery unit whose primary role is to investigate threatened municipal water supplies. The unit is equipped with an in-house laboratory and measuring instruments.

Since 1994, the Site Discovery unit has investigated 13 wellfields serving 90,100 people and covering 16,548 acres. The unit identified approximately 140 potential sources of contamination. Aided by small-diameter driven wells, the unit has assessed 91 properties, collecting more than 600 soil gas and/or groundwater samples. In one day, the unit can perform an investigation, collect samples, screen the samples, and obtain soil gas and groundwater data. NERO has issued 21 Notices of Responsibility to PRPs for newly discovered sites and made 74 referrals of properties to other programs which resulted in 17 Notices of Noncompliance being issued. The unit's work has resulted in the discovery of a number of the greatest drinking water threats in the region, which would not otherwise have been known until municipal wells became contaminated.

DEP's Southeast Regional Office's unique geology results in the Commonwealth's largest zones of contribution to water supplies. These large areas contain many potential

contamination sources that could threaten the region's water supplies. SERO has devoted approximately 0.5 FTEs to a pilot project designed to build partnerships with water suppliers.

SERO held a series of workshops with local and state officials to share information about potential sources of contamination. Eighteen public water suppliers in 16 communities (serving 20% of the region's population with drinking water) completed voluntary land use surveys to catalogue possible threats to 46 local water supplies. This effort resulted in identification of 186 potential sources. SERO has followed up with inspections at three of the most sensitive water supplies, and as a result referred a number of facilities to DEP's Waste Prevention and Resource Protection programs for follow-up enforcement actions. In addition, SERO issued several Notices of Responsibility for releases and threats of releases of oil or hazardous material discovered. This pilot is not only identifying potential threats, but has spurred awareness and the establishment of new partnerships with communities for addressing environmental contamination problems

DEP's Central Regional Office (CRO) is currently undergoing the most rapid economic and industrial growth in the state. This region contains the Quabbin and the Wachusett Reservoirs, the metropolitan Boston area's two major drinking water sources.

CERO's Site Discovery unit has two full-time staff dedicated to conducting site discovery investigations and other duties, and is in the process of adding a third FTE.

Since 1994 the unit has prioritized 70 public water supplies (with assistance from DWS) and conducted seven comprehensive public water supply investigations, four of which are still ongoing, and two more targeted investigations These efforts resulted in the listing of five new disposal sites within interim wellhead protection areas and established zones of contribution to public wells, and the initiation of state-funded response actions to address contaminated groundwater. Three of the five disposal sites discovered were either in or near active or former gravel mining operations.

DEP's Western Regional Office (WRO) has prioritized the Western region's 150 water supply sources and proactively investigates contaminated sources. The unit has one full-time person assigned to site discovery activities.

WRO gathers data with the goal of uncovering significant threats to water supplies and identifying contaminant sources. Contaminant plumes are often assessed using small diameter driven wells and field instruments (e.g., gas chromatography), and samples are taken from private wells and from soil gas. WRO has assessed water supplies that serve a total of 59,310 people.

WRO has tested over 540 private wells, discovered a 4.5 mile TCE plume affecting four towns in a sole source aquifer (which was delineated by installing over 140 small-diameter wells), ruled out through investigation a number of possible TCE sources, identified one previously unknown hazardous waste site (unrelated to the TCE plume), reduced health risks by replacing contaminated drinking water with bottled water or whole house filters, worked jointly with one town to install a new public water distribution line as a risk reduction

measure, highlighted the importance of proper septic system maintenance (one TCE source was a private septic system), and worked closely with local communities by providing education through one-on-one and public meetings.

Site Discovery Issues and Recommendations

One of the goals of site discovery is to identify enough sites to enable DEP to meet the requirements of Section 3A(p) of c. 21E (i.e., ensure response actions at 100 sites each year that pose the greatest risks). While many water supplies and other areas have been systematically selected and examined, only a handful of potential Tier IA sites have been discovered through site discovery efforts. At the same time, these site discovery efforts have ruled out a number of threats and discovered some waste sites and facilities with illegal discharges. However, these results raise the question of whether DEP should expand its focus.

DEP is concerned that the current approach may focus too much on public wells and not enough on private wells where people may not know they are drinking contaminated water. In addition, staff also proposed that site discovery staff follow up on Downgradient Property Status Submittals, which indicate the discovery of contamination where the source is not on the filer's property and is often unknown.

By statute DEP must and will continue looking at public water supplies, but recommends a shift in emphasis to other potential receptors, including areas which rely on private water. Other areas to look for "worst sites" could include densely populated urban areas where, for example, imminent hazards from vapors in buildings might be a problem from the release of volatile contaminants. Downgradient Property Status Submittals may also provide good leads for sites currently outside the system.

Compliance and Enforcement

The redesigned program is premised on timely, voluntary actions by PRPs to address contaminated sites, using LSPs to guide them through the process, make technical decisions, and oversee response actions. PRPs who voluntarily perform response actions benefit from the ability to quickly address problems with little to no upfront state involvement. At these sites, DEP monitors private sector responses through audits, inspections, and other means to ensure compliance with cleanup requirements.

Inevitably, however, there are those PRPs who do not take the initiative to clean up their sites, or who conduct work but fail to do so within the timelines prescribed in the MCP. Ensuring that these PRPs conduct response actions in compliance with the MCP is a priority for DEP both to ensure that releases do not put public health and the environment at risk, and to establish a level playing field for PRPs who are voluntarily performing timely cleanups. In many cases, enforcement is the best option for addressing these sites.

Overall, compliance and enforcement activities have increased as the new program has been implemented. Staff resources devoted to these efforts have jumped from 4.1 FTEs in FY 1994 to 28.9 FTEs in FY 1997 (see Table 3-1). In addition to compliance assurance and enforcement, these staff

also provide technical assistance to LSPs and their clients and provide information about findings of audits and other compliance efforts.

Since the new program started, DEP has conducted 626 audits of response actions managed by LSPs. Over the past three fiscal years, DEP also has conducted more than 3,000 compliance inspections to determine whether cleanup is occurring in accordance with rules and site-specific approvals. This effort has resulted in 1,375 Notices of Noncompliance and 70 cases where penalties were assessed (with a total value of $381,325). Fifty-five cases have been referred to the Office of the Attorney General for prosecution and/or the US EPA for federal enforcement, and another 8 have been referred to the LSP Board for disciplinary action against the LSP.

Table 3-6
21E Compliance and Enforcement Statistics

Action	FY95	FY96	FY97	FY98[13]
Compliance Inspections	237	888	1,009	901
Anniversary Letters	*	1,627	950	670
Interim Deadline Letters	*	361	212	212
Notices of Response Action	*	57	39	8
Request for Information	*	70	128	115
ACOs/UAOs♦	5	16	26	31
NONs/Field NONs	361	344	268	402
Notices of Audit Finding	*	210	224	121
Notice of Enf. Conference	*	*	25	22
Penalties†	6/$11,750	20/$103,725	27/$151,700	17/$114,150
Referrals to AG, EPA etc.	4	9	8	34
LSP Board Referrals	*	*	3	5

* *No information available; tracking systems were under development*
¨ *Administrative Consent Orders (with and without penalties)/Unilateral Consent Orders*
† *Penalties=ACO penalties+Penalty Assessment Notices(PANs)*

To increase compliance of private sector responses, DEP is:

- Issuing Notices of Noncompliance (NONs), and higher level enforcement[14] when clear violations of the MCP are found. In the vast majority of cases, these are issued to PRPs. The PRPs then turn to their LSP to manage the required work. In some cases, adverse audit findings and enforcement actions have resulted in LSPs being replaced. In other cases, the LSP and PRP work out who bears what costs for the additional work.

[13] Partial year; July 1 through February 28, 1998.
[14] The vast majority of higher level enforcement actions in the 21E program are directed towards parties who fail to report releases or to those that do not perform response actions after a release has been reported (non-responders).

- Increasing enforcement against "nonresponders." DEP needs to devote more resources to and streamline enforcement against parties who should be cleaning up but are not doing so.

- Issuing NONs, and, where appropriate, higher level enforcement, directly to the party causing the problem. This is most often the PRP, but can include LSPs and response action contractors where they perform response actions without required approvals or do not comply with conditions in approvals.

- Obtaining resources to perform more audits. This is being attacked from two directions: 1) streamlining the existing audit process to allow current staff to perform more audits (i.e., cutting the average time per audit); and 2) using funds recently made available by EPA to add additional staff to each regional audit section.

- Continuing development of compliance assistance efforts (e.g., joint LSP/DEP training in specific program components such as AULs, issuing deadline reminders, continued guidance development) aimed at improving the overall quality of work. These efforts are focused on the types of problems found in audits resulting in modification and retraction of LSP Opinions, so that over time LSP Opinions will improve.

- Working with the LSP Board to develop better DEP referrals of complaints about LSPs who may have violated the Board's professional standards, and to assist the Board and its staff in investigating complaints.

Audits

DEP retained TechLaw Management Consultants to provide independent assistance in evaluating the adequacy of DEP's efforts to ensure that response actions not directly overseen by the agency are performed in compliance with cleanup requirements, focusing particularly on DEP's audit program, which is the most visible tool DEP uses to assess compliance.

TechLaw analyzed data and information from multiple sources to develop its findings and conclusions, including internal and external documents and data, as well as interviews and focus group sessions with key program stakeholders, including DEP managers and auditors, LSPs, the LSP Board, PRPs or their attorneys, and environmental advocacy groups. TechLaw documented their evaluation and recommendations in a report to DEP, which DEP has summarized below.[15] TechLaw made a number of recommendations for improvements, but also noted that overall the revised 21E program appears essentially sound and effective in accomplishing the goal of cleaning up sites, and that without exception, all external and internal stakeholders generally praised the new program for enabling PRPs to proceed with site cleanup and closure.

TechLaw identified a number of areas that affect DEP's ability to implement the audit program and proposed recommendations for improvements. Many of these recommendations build on and

[15] A copy of TechLaw's full report may be obtained by calling the MCP Helpline at 617-338-2255.

standardize innovations and accomplishments achieved by the DEP audit program over the past five years. TechLaw identified program standardization, process efficiency, and establishment of a credible deterrence for inadequate work as the central themes for improving the audit program overall.

1. Audit Standardization

20% Audit Target

Chapter 21E mandated that DEP audit 20% of sites paying annual compliance assurance fees. The 20% requirement was derived through negotiations with stakeholders in 1992 and not by statistical means. Using its current definition of an audit, DEP is not meeting this requirement. DEP's rate for auditing this universe has decreased (from 7.3% in FY95 to 4.2% in FY97), even though DEP has increased the number of audits conducted each year. TechLaw concluded that auditing 20% of response actions may not be necessary to determine the effectiveness of the program overall. However, because the audit program is not entirely standardized and there are inconsistencies in the way it is implemented across DEP regions, an alternative audit goal that is statistically meaningful cannot currently be identified, and meaningful statistical analyses of current audit results cannot be performed. Therefore TechLaw focused their recommendations on the development of a standardized audit program that will allow future statistical analysis, improve process efficiency, provide greater deterrence to noncompliance, and enable DEP to meet the statutory 20% goal by counting compliance activities the agency currently performs. Once these goals have been achieved, TechLaw has suggested re-evaluating the 20% requirement, to see if it could be replaced with a more meaningful mandate.

Audit Definition, Goals, and Scope

An effective, well-functioning audit program requires clear definition of audit goals and scope. TechLaw found that:

- The MCP definition of an "audit" differs in important ways from generally accepted audit definitions, which has contributed to the lack of program standardization.

- There are divergent views and interpretations of the purpose of the audit program, which has inadvertently affected the manner and consistency with which audits are performed.

- Currently, DEP is conducting numerous activities that satisfy the MCP audit definition; however, these activities are not being credited as audits due to an overly conservative interpretation of the MCP, thus constraining its ability to achieve the 20% target.

- TechLaw recommended the following to establish the foundation for a standardized, consistent audit process:

    * Clearly redefine the term "audit," to more closely reflect the elements of consistency and standardization.

- Re-evaluate, and if appropriate, adopt and clearly communicate the goal of the audit as that which is defined in the MCP.

- Expand the scope of audits to include and technical screening of submittals and compliance inspections (announced and unannounced) could include sites with operating treatment systems, sites with AULs, etc.

Organizational Effectiveness

TechLaw concluded that the effectiveness of DEP's audit program is directly affected by the management structure and systems that are in place to support it, including organizational structure, performance measurement and accountability systems, and auditor skills and training. This infrastructure is currently not standardized or fully coordinated, and DEP does not have mechanisms in place to ensure that the program is consistent. Therefore TechLaw recommends that DEP should:

- Centrally coordinate and manage the transition to and implementation of the new standardized audit program.

- Develop and implement a standardized system for measuring, monitoring, and managing the performance of the audit program at the State and regional levels.

- Undertake measures to ensure that DEP auditors possess or have access to the skills, experience, and training that is appropriate for the audit being undertaken.

2. Audit Process Efficiency

TechLaw found differences in the audit process across regions and a lack of standardization. For example:

- DEP does not currently use standard, formalized audit criteria and protocols (e.g., standardized checklists).

- There is inconsistency and ambiguity regarding the proper application of the terms "violation" and "deficiency" to audit findings, which has limited DEP's ability to make full use of available enforcement actions.

- Audit endpoints are not well delineated, which has led to delays in issuing Notices of Audit Findings (NOAFs).

- NOAFs are not standardized in terms of content.

TechLaw concluded that DEP's audit program would become more efficient through the development and use of standardized and streamlined checklists, audit endpoints, audit reports, and other systems. Some of TechLaw's specific recommendations include:

- Institute an audit hierarchy that formalizes and standardizes the array of legitimate "auditing" activities presently conducted by DEP (Exhibit B).

- Use the audit hierarchy to segment site populations statewide in order to select sites for random, targeted, and unannounced audits.

- Develop standardized checklists for each audit activity in the hierarchy and pattern NOAFs from the checklists.

- Develop a three-category system for classifying audit findings in terms of the severity of problems, and link audit findings to appropriate enforcement options.

- Provide an opportunity to PRPs and LSPs prior to issuance of NOAFs to clarify information and ensure that NOAFs are based on all relevant facts.

- Separate compliance assistance and other followup (e.g., enforcement) from audits so that audit findings document the condition of the site and response actions *at the time of the audit*.

Figure 3-2 describes elements of the proposed audit hierarchy.

Figure 3-2

	Technical Screen	Comprehensive Audit	Unannounced Audit
Purpose	• Identify substantial problems • Segment sites by risk	• Evaluate sites comprehensively to ensure compliance with MCP	• Evaluate specific on-site activities
Output	• NOAF/completed checklist	• NOAF/completed checklist	• NOAF/completed checklist
% Audited	• 90% of RAOs and DPS submittals • 20% of all other	• Overall, 5% of sites paying fees	• 2% of sites
Benefits	• Higher screening across regions than is currently being done • Segments population • Helps achieve 20% mandate	• Consistent process • Efficiency gains in time and resources • Clear endpoints expedite audit closure • Statistical analyses possible	• Increase credible deterrence • "Spot checks" of active work or AULs

3. Ability to Provide a Credible Deterrence to Inadequate Private Sector Work

The audit hierarchy described above will help provide more of a deterrence to poor quality work than exists today by increasing the number of technical screens, instituting unannounced audits in the program, and linking audit findings to appropriate enforcement actions in a consistent way. In addition, TechLaw identified the poor quality of some submittals as an issue that affects the audit program. The ability of DEP to meet its auditing objectives is directly affected by the quality of submittals. Clearly, the willingness of DEP auditors to reduce their level of oversight will be proportional to the degree to which they are assured of the soundness and integrity of LSP opinions. TechLaw found that:

- The sub-standard work of a portion of LSPs has produced mistrust among many DEP auditors for the work of LSPs in general; this may limit the ability of the privatized program to achieve its full potential.

- There is an across-the-board consensus among DEP, LSPs, the LSP Association (LSPA), and the LSP Board that it is in their mutual best interests to ensure that all LSPs meet high standards of professional conduct, and to take steps against under-performing or "bad actor" LSPs.

- The LSP Board complaint referral and disciplinary process has not yet proven to provide an effective deterrent for sloppy and inadequate work by LSPs.

- The specialized technical nature of LSP work may warrant the involvement of technical specialists in Board investigations of complaints (please see Chapter 10 on the LSP Board).

- The LSP Board's investigation process is likely to be affected by resource constraints if there is a material increase in the number of complaint referrals.

- LSPs have voiced strong praise for DEP training courses and information sessions related to the DEP auditing program.

The current program would benefit from strengthened measures to assure that LSPs are developing the highest quality submittals. Successful transition of site cleanup oversight to the private sector requires a system that provides assurance to all stakeholders that the system strongly encourages the exercise of best professional judgment throughout the site cleanup process. TechLaw made specific recommendations for DEP and the LSP Board:

DEP:

- DEP should increase its practice of filing complaints with the LSP Board as an explicit part of its enforcement strategy.

- DEP should work with the LSP Board to explore ways to simplify the current process by which DEP auditors must support the Board in investigating complaints.

- DEP should develop a simple, standardized database for tracking LSP performance trends statewide.

- DEP should continue and expand training and informational sessions with LSPs and the LSP Association.

LSP Board:

- The LSP Board should initiate outreach activities (that it has been developing) to increase awareness among prospective complainants of the Board's complaint referral process.

- The LSP Board should take steps to boost confidence among DEP auditors and other stakeholders that the complaint investigation process, once initiated, will produce results that reinforce credible deterrence.

- The LSP Board should prepare to manage the likely increase in complaint referrals associated with the above series of recommendations.

DEP agrees with TechLaw's analysis and is planning to develop a more standardized audit program based on TechLaw's recommendations. TechLaw has indicated that the audit hierarchy and segmentation of sites is flexible and can be adapted as DEP fleshes out the details of how the program would work. TechLaw estimates that transition to the new program model could be accomplished within a 12 month period.

"Nonresponder" Enforcement

While it is important to make sure that on-going private sector responses are adequate, it is equally important to make sure that parties who are legally responsible for cleaning up are doing so. Most of DEP's compliance and enforcement efforts have focused on sites where PRPs are making an effort to comply with DEP's rules. Increasingly, DEP has begun to shift more emphasis to those who should be cleaning up but are currently not doing so, particularly those who have either refused to conduct response actions or who have failed to implement response actions in compliance with assessment and cleanup timelines. There are two primary areas where increased enforcement efforts are needed: default Tier IB sites and sites which miss Phase submittal deadlines.

Default Tier IB Sites

There are currently 1,568 "default Tier IB" sites. Default Tier IB sites are not classified based on actual site conditions, but because the PRPs have failed to meet one of several significant deadlines for assessment or cleanup. These sites may or may not pose the same levels of risk as "true" Tier I sites. There are three general categories of sites that fall into the default Tier IB universe:

- Sites where PRPs took initial response actions and may have even completed a full cleanup, but where proper paperwork (i.e., an RAO) has not been filed with DEP.

- Sites where PRPs took initial response actions and then ran out of money and either stopped work or continued to operate treatment systems but did not Tier Classify (e.g., there are 168 residential default Tier IB sites), and

- Sites where PRPs have reported contamination but never initiated response actions.

DEP considers default Tier IB sites to be a priority for enforcement. Making sure all PRPs conduct necessary response actions creates a level playing field, maintains the integrity of the privatized program, and acts as a powerful incentive for voluntary compliance. DEP's approach to this issue is three-fold: promoting greater awareness of the responsibility of PRPs to meet their obligations, publishing a list of default Tier IB sites on an annual basis, and taking enforcement against PRPs who refuse to respond. DEP enforcement strategies take into account the different circumstances associated with each site.

To encourage early, voluntary action, DEP sends compliance reminder letters to all sites before they reach their Tier Classification deadline to remind them of their obligations. These letters are partly responsible for the fact that approximately 85% of all releases comply with the one year Tier Classification deadline.

For those sites that miss the one-year deadline and default to a Tier IB status, DEP lists the sites on the annual Tier I Disposal Site List. Prior to listing, DEP sends letters to the PRPs encouraging voluntary action to avoid listing.

The first Tier I Site List was published in June 1997 and included 918 default Tier IB sites (a reduction of 20% from January 1997 when DEP sent warning letters to approximately 1,500 PRPs with sites in a default Tier IB status). The second Tier I Site List will be published in Fall 1998, and will include up to 1,049 default Tier IB sites (PRPs for these sites have until July 31, 1998 to take action to avoid listing).

PRPs who do not respond to DEP's compliance promotion efforts risk enforcement actions, which include Notices of Noncompliance and possibly penalties.

Options:

- Continue compliance promotion efforts in conjunction with the publication of the Tier I site list and followup enforcement actions.

- The large size of the default Tier IB universe makes traditional enforcement approaches (which are extremely resource intensive) difficult. While taking traditional enforcement actions as resources allow, DEP must develop alternative streamlined enforcement strategies that will have a greater effect and bring more sites into compliance.

Phase Submittal Compliance

Sites default to a Tier IB status if they miss the one-year deadline for Tier Classification. Sites that Tier Classify but then stop work do not default but are still in noncompliance. As noted in Chapter 1, there is a low compliance rate for PRPs meeting Phase submittals deadlines after Tier Classification. DEP is currently developing a strategy to address noncompliance with Phase deadlines.

Options

- Begin sending deadline reminder letters for Phase deadlines (beyond what is currently done for the one-year Tier classification deadline) to encourage compliance.

- Continue development of enforcement strategies to deal with inadequate response actions and failing to take response actions, with coordination by the newly created BWSC Compliance and Enforcement Section in the Boston Office. In order to expedite enforcement actions against nonresponders and PRPs who miss MCP deadlines, continue publishing lists of default

Tier IB sites with missed MCP deadlines, develop a standard Notice of Noncompliance and Penalty Assessment Notice for MCP missed deadlines.

- Continue ongoing compliance assistance such as LSP training, guidance development, informal meetings with LSPs and PRPs, etc., aimed at improving the overall quality of private sector work.

Technical Standards and Guidance

To successfully implement the redesigned program, clear, reasonable standards and guidelines are needed for making assessment and cleanup decisions. The redesign of the program was designed to free up resources to focus on developing standards and technical protocols for assessing sites, characterizing risks, and implementing remedial technologies. Below is a list of standards and guidelines that have been finalized and projects that are underway. DEP will continue develop of draft policies and seeks comments on which ones should be developed first and what additional guidance is needed.

Risk Characterization

Final

- Guidance for Disposal Site Risk Characterization (including ecological risk)
- Risk Assessment Shortform - Residential Scenario
- #2 Fuel Oil/Diesel Residential Shortform
- Interim Final Petroleum Report - Development of Health-based Alternative to the Total Petroleum Hydrocarbon (TPH) Parameter
- Background Documentation for the Development of the MCP Numerical Standards

Draft

- Risk Assessment Shortform - Industrial/Commercial Scenario
- Urban Background Levels
- Characterizing Risks Posed by Petroleum Contaminated Sites - Implementation of MADEP VPH/EPH Approach

Site Assessment Protocols

Final

- Policy for the Investigation, Assessment, and Remediation of Petroleum Releases - Interim Site Investigation Protocol Document
- Underground Storage Tank Closure Assessment Manual
- Standard References for Monitoring Wells
- Standard References for Geophysical Investigation
- Determining Non-Potential Drinking Water Source Areas
- Numerical Ranking System Guidance Manual
- Removing Your Underground Heating Oil Tank: A Homeowner's Guide

Draft

- Assessing Contamination at Residential Underground Heating Oil Tanks Closures
- Petitioning for a Case-Specific Designation of a Non-Potential Drinking Water Source Area

Remediation/Site Closure

Final

- Off-Gas Treatment of Point-Source Remedial Air Emissions
- Interim Remediation Waste Management Policy for Petroleum Contaminated Soils

Draft

- Activity and Use Limitation Guidance (scheduled for completion in July 1998)
- Guidance on Evaluating the Feasibility of Approaching or Achieving Background

Other

Final

- Policy and Guidelines for Secured Lender Liability under Chapter 21E
- Public Involvement Plan Interim Guidance For Waiver Sites
- Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)
- Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)

Draft

- Public Notices

Information Distribution

DEP currently makes information about the Waste Site Cleanup Program and specific disposal sites available in a number of ways.

Information about regulations and policies: In 1993 DEP established the MCP Helpline (formerly the MCP Hotline) to provide a central point of contact for LSPs, their clients, and the public for questions about the MCP and other policy issues. Since 1993, the Helpline has responded to more than 4,000 calls annually. DEP has also published "MCP Q&As" on a semi-annual basis, which disseminate answers to the most common Helpline questions and other issues which require clarification. The MCP, MCP Q&As, and other policies are posted on DEP's Web page, where they can be downloaded by anyone with a computer, modem, and Internet connection. Large technical policies are made available to the public through the State Bookstore, which is located in Boston and Springfield (and will send documents by mail order). In addition, DEP's regional offices handle hundreds of calls each year about regulatory requirements and their application to specific situations.

LSPs and other stakeholders report that in general the Helpline has been a useful resource, but has become less so now that they are gaining experience with the basic program framework. LSPs now have fewer regulatory questions and more site-specific technical questions which can be better handled by technical staff in DEP's regional offices. Additionally, some issues with the HelpLine service have been raised: some callers are uncomfortable if they cannot reach a "live" person (the Helpline works off voice mail messages for most calls), and some people reported that their calls were not returned for two to three days (or in some cases not returned at all). Also, there have been situations where the Helpline responses were inconsistent with responses provided by regional staff, or where responses were felt to be ambiguous. LSPs indicated that MCP Q&As have been helpful and should continue to be published.

Options for Improvement:

- DEP should work to ensure that staff can be reached when the HelpLine is in operation (currently four out of five business days) and that, when messages are left, calls are returned within one business day.

- While the Helpline can continue to deal with general calls and policy questions, HelpLine staff should coordinate more closely with a network of subject-matter experts where the calls deal with sophisticated application of regulations or policy. Site-specific technical questions should continue to be handled by staff in DEP's regional offices.

- DEP should publish a consolidated, updated list of MCP Q&As, and should publish additional Q&As on a periodic basis.

Information about the condition/status of specific sites: The 1990 Study Committee agreed that DEP should be the repository of information about contaminated sites, and that this information should be made available to the public. To accomplish this (as well as to provide DEP with information to start audits), the MCP requires that PRPs submit specific plans and reports describing response actions and LSP Opinions to the agency. These submittals are placed in DEP's files in the appropriate regional office, and are available for review by the public (by appointment). Also, key information from these submittals is entered into DEP's databases, which can be accessed via DEP's World Wide Web Page.

Site Files: Managing the volume of paperwork submitted for response actions poses a significant challenge for DEP. There are over 2,000 releases reported to DEP each year; DEP must create a new file for each release. Subsequent site plans and reports generated from response action are placed in these files, some of which may be voluminous. Old site files generally cannot be archived because prospective purchasers, lenders, and people doing site assessments rely on historical information about contamination in the area of the property being assessed. As a result, many DEP regions are running out of file storage space, and managing public file reviews (done through DEP's Regional Service Centers) requires significant staff effort. In DEP's Northeast Regional Office (which has the highest volume of releases), appointments to review site files must be made several weeks in advance. Security of site information is also an issue; inevitably some documents have "disappeared" from DEP's files, creating a headache for

DEP staff, LSPs, and anyone else who wants to review information that is no longer available. Due to inadequate filing resources some documents have been misfiled.

Local officials report similar problems managing paperwork they receive as a result of the 21E program. The MCP requires that PRPs send notices to local officials about major response action milestones. Town Managers and Boards of Health do not always know what to do with notices and many throw them away. Public libraries which house local information repositories for Public Involvement Plan sites are also often overloaded with site information and do not have the resources to maintain site files so that they are easy to review.

Electronic submittals, storage and distribution of site reports and notices may be a way to ease the paper burden in the future. DEP's ongoing "Info 2001" project, which is examining ways to better collect, manage, and make available environmental information agency-wide, may help the Waste Site Cleanup Program address some of these issues in the future (e.g., electronic submittal of site documents; storage on CD-ROM). These efforts may relieve some of the demand for access to specific files in the DEP regional offices in the future. Until they can be implemented, some stakeholders have suggested that DEP expand file review hours, and/or make file reviews available outside of business hours. While this may not be possible with existing DEP staff, the agency solicits public comment on ways to make its information more accessible to the public.

Some PRPs and LSPs have suggested that some submittals are not necessary (particularly status reports on implementation of IRAs and RAMs, as well as the operation and maintenance of remedial treatment systems). While cutting down on the frequency with which these submittals are required would certainly cut down the volume of paperwork that PRPs have to pay for and that DEP has to manage, the agency has found this information to be valuable when it is submitted, and an indication that response actions are not being conducted in accordance with requirements when they are missed. DEP solicits public suggestions for specific ways to streamline reporting and reduce paperwork burdens while maintaining an information base for the agency's compliance program and other stakeholders' information needs (e.g., prospective purchasers of contaminated property).

Web Page: Waste Site Cleanup databases can be accessed "on-line" via DEP's Web page, which stakeholders have generally praised. The data bases are updated on a quarterly basis, and are currently being combined into one, which will make on-line searches for information about specific locations (or specific areas) easier. Suggestions for improvements have included updating site lists on the Web more frequently, providing Regional Service Centers with computers with Web access so people can more easily search site databases, and making it easier to download files and access information via the Web. These improvements coupled with outreach to key groups (e.g., local officials, site neighbors via the Toxics Action Center, etc.) may make public access easier. DEP is also considering making the results of audits more accessible to the public via its Web page (currently copies in binders are available at DEP's four regional offices and Boston office during business hours).

Information about property conditions that is not directly related to response actions: While the 1990 Study Committee recommended that DEP maintain information about site contamination and make that information available to the public, the Study Committee also believed firmly that

the agency should not collect information that is not directly related to its implementation of c. 21E. Through the on-going discussions of how to encourage the cleanup and reuse of "brownfields" sites, some real estate interests have suggested that DEP databases should include information about contaminated property that would assist in its marketing, e.g., lot size; building types, sizes and conditions; property zoning; availability of utilities; and information about the owners' interests in selling.

While DEP understands that such information would be useful for both buyers and sellers of contaminated property, the agency agrees with the initial Study Committee recommendation that it focus on information needed to implement its statutory mandate, and leave supplemental information gathering efforts to others who may be better equipped to obtain the desired information and keep it up to date. DEP has shared its databases with a consortium of utilities (the Massachusetts Economic Development Alliance), which provides a wide variety of information about commercial and industrial property that is available for sale to prospective purchasers and their agents. Now that the Waste Site Cleanup Program's databases are available via the Web, DEP believes that real estate interests should develop the information bases that they seek (possibly with assistance from the Massachusetts Office of Business Development), and should incorporate as much or as little of DEP's information as they want. Public comment is sought on what role the Commonwealth should take in developing this type of information, and particularly on the role that DEP should play in these efforts.

Permit and Compliance Fees

Prior to the redesign, the Waste Site Cleanup program was funded in two ways:

- Bond funds provided DEP with the resources to respond to releases of oil and hazardous material when PRPs were unwilling or unable to respond in a timely manner. A fee paid by licensed hazardous waste transporters was used to cover debt service on the bonds.

- Legislative appropriations from the Environmental Challenge Fund (created in 1987 for the 21E program) and other sources provided DEP with resources to cover operating expenses (e.g., staff, training, rent). The Environmental Challenge Fund is replenished by administrative penalties collected by DEP and by costs recovered from PRPs for DEP oversight and for sites where DEP has spent public money to conduct assessment and cleanup activities.

The redesign of the 21E program created an additional source of funds for the program: In July 1992, Section 3B of ch. 21E was amended to give DEP the authority to charge permit and compliance fees for 21E activities[16]. Fees were originally intended to simplify the recovery of staff oversight charges by establishing average-cost fees in place of bills based upon actual staff time on specific sites. DEP developed the MCP fee structure with the following objectives:

- Fees should cover DEP staff time spent reviewing permits and conducting audits and conducting compliance and some enforcement activities; and,

[16] Similar authority is granted to other DEP programs by M.G.L. ch. 21A.

- Fees should create incentives for private parties to conduct timely cleanups (i.e. the quicker a site is cleaned up, the fewer fees will be incurred).

In 1992, a workgroup of DEP staff and a management consulting firm established a general framework and dollar amounts for Tier I permit fees and compliance assurance fees. Fee amounts were set on the assumption that fees charged should bear a reasonable relationship to the DEP services provided (i.e., permit review), and should be scaled based on site complexity. To establish the permit application fees, DEP estimated the number of hours it would take to review a permit application and multiplied this figure by an hourly rate[17] of $57.67 to arrive at fee amounts (the same hourly rate used in all other DEP permit fee calculations). Similarly, compliance assurance fees were established based on anticipated staff time required to conduct audits and enforcement for various types of submittals and sites, multiplied by an hourly rate of $82.12 (the same figure used in all other DEP compliance fee calculations, which is higher than the permit rate to account for anticipated legal support). This figure was then divided by a factor of 5, assuming a 20% audit rate for all sites (the minimum rate stated in ch. 21E).

DEP established a single permit fee[18] ($3,550) for Tier 1A, 1B, and 1C applications, and a single fee for permit transfers, modifications, and extensions ($1,200); both of which must be paid at the time of application and which trigger DEP review timeframes. The compliance fee system has two types of fees: (1) annual fees, based on site classification (e.g. Tier 2, Tier 1C, Tier 1B, Tier 1A, or Phase V/Post RAO-C Operation and Maintenance[19]), which are billed annually by DEP in arrears following each year until site cleanup is completed; and (2) one-time compliance fees paid at pre-classified sites when a RAM, RAO, or DPS[20] is submitted to DEP.

To create a financial incentive for timely cleanup, first year annual compliance fees (ACFs) are waived for sites that Tier Classify within the first year, and no one-time compliance fee is required for RAOs that are filed within 120 days of release notification. When PRPs conduct site work but fail to file an RAO, DPS, or Tier Classification within the first year, their sites automatically default to a Tier 1B category, and a compliance fee of $2,600 is assessed for that year.

When the redesigned program began, the permit application fees and one-time compliance fee collections proceeded generally as designed and were submitted routinely without significant DEP resource investment. However, for the compliance fees requiring proactive billing, DEP has faced several significant implementation challenges. BWSC's computer tracking and invoicing systems were not equipped to handle fee tracking. In addition, several key legal/policy decisions affected the billing eligibility of particular PRPs and sites created additional difficulties. While intended to nearly eliminate the complex tracking of hourly oversight management by DEP staff and

[17] The hourly rate consists of a direct staff pay rate plus an indirect rate to account for administrative support and general overhead.

[18] Three permit fees were created for application, amendment, and release of Grants of Environmental Restriction; these fees are not discussed in this evaluation due to a very small universe of involved sites.

[19] Annual Compliance Fee Amounts: Tier 2 - $1,300; Tier 1C - $1,950; Tier 1B - $2,600; Tier 1A - actual DEP staff time capped at $10,000 per year; Phase V Operation, Maintenance, and/or Monitoring / Post RAO Class C Active Operation and Maintenance [both in lieu of Tier 1 or 2 fee] - $500.

[20] One-time Compliance Fee Amounts: RAO - $750; RAM - $500; DPS - $1,000.

associated costs, annual compliance fee billing and collection nearly doubled the workload of the cost recovery and revenues staff. These and other startup difficulties encountered resulted in the retraction of the first round of annual compliance fees in 1996, which began a billing backlog.

As part of this fees evaluation, DEP reviewed the fee program established in the MCP and in DEP's fee regulations (310 CMR 4.00, Timely Action Schedule and Fees Provisions). The objectives of this review were to determine (1) the accuracy of assumptions made in the establishment of the various fee amounts, (2) the effectiveness and efficiency of the fee system, particularly in terms of providing a compliance incentive, (3) implementation challenges, and (4) options for system improvement.

Information for this evaluation was obtained from a variety of sources, including BWSC's environmental databases (the Sites database and the Front End database), DEP's Permit and Information Management System (PIMS) and Time Management System (TMS), internal tracking databases from the BWSC Audit Branch and Division of Fiscal Management, Cost Recovery, and Administration (FMCRA), and the Bureau of Administrative Service's Fiscal Group, as well as the State Comptroller's Billing and Accounts Receivable Systems (BARS),

Fee Amounts

A fundamental question that must be answered in evaluating 21E fees is whether fee amounts are set appropriately. To answer this, DEP evaluated whether the permit and compliance fee amounts appropriately reflect actual staff time spent on activities which the fees are supposed to cover.

Permit Fees: To assess the accuracy of the assumptions made in establishing the permit fee amounts, DEP's average *actual* cost was calculated for each type of permit review. This was done by determining the average hours spent by staff for each type of permit, and multiplying this figure by the hourly rate used to originally determine the permit fee amounts ($57.67/hr). Table 3-7 presents the results of this calculation compared to the permit fee currently set in DEP's fee regulations.

Table 3-7: Actual Average Cost Per Permit vs. Permit Fee

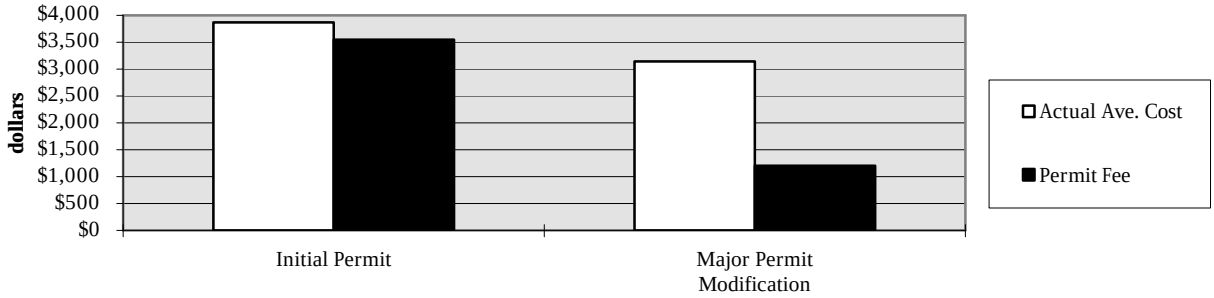


Table 3-7 illustrates that the fee established for the Initial Tier 1 permit application is set close to the actual time DEP is spending on permit reviews, but that the fee for the Major Modification is set significantly below average actual staff time. This discrepancy may be due to the large number of Transition Priority sites that submitted Major Modifications at the beginning of the new

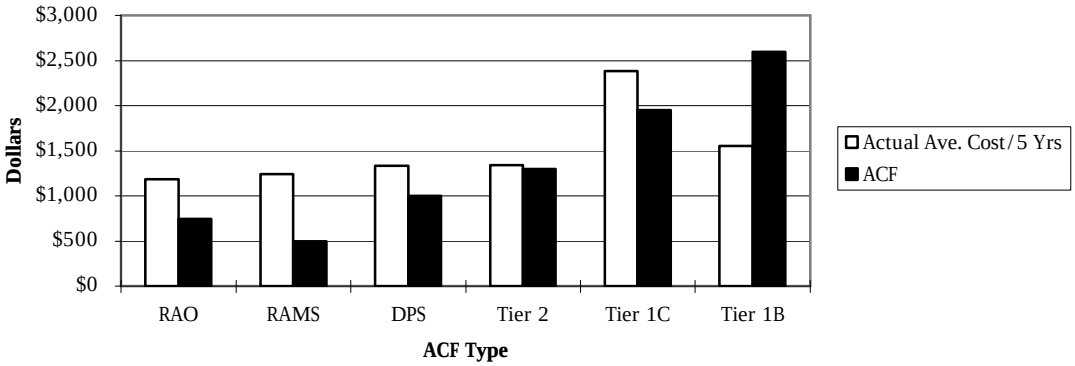
program. The scope and complexity of these Modifications, which necessitated staff review time similar to initial permit applications, was not anticipated when the fee was set. The universe of classified sites that have filed Modifications unrelated to Transition Priority sites is too small to draw definitive conclusions. However, it is anticipated that average staff costs associated with these Modifications (apart from the above-referenced Transition site submittals) is probably lower than the figure presented in Table 3-7. Therefore, DEP does not recommend increasing the Major Modification fee at this time.

Annual Compliance Fees: To evaluate the annual compliance fees (with the exception of Tier 1A fees, which are based on actual staff costs), time tracking data was tabulated for a sample universe of sites that had been audited. This sample universe contained sites from all regions (both transition and new releases), a variety of fiscal years, types of audit findings (e.g. no violations found, reclassification required, NON issued), and type of submittals audited.

The average number of hours spent on each type of audited site was multiplied by the hourly rate initially used to calculate the fee ($82.12), and then this staff cost was divided by 5 to approximate the 20% audit rate used in setting the original ACFs.

Table 3-8 presents the average staff cost for each type of ACF[21] compared to the current compliance fee amount set in regulation.

Table 3-8: Actual Ave. Costs vs. ACF Amount



Based on the sample population, the results generally indicate that the assumptions originally made in setting the ACFs approximate the actual time being spent during audit, compliance, and enforcement activities. The only category where actual time spent is less than the predicted amount is Tier 1B sites. However, it is not possible to draw definitive conclusions about the Tier IB fee amount due to the small number of audits of Tier IB sites conducted to date. Therefore, DEP does not recommend compliance fee changes.

Fees System - Effectiveness and Efficiency

[21] The Phase V Operation, Maintenance, and/or Monitoring / Post RAO Class C Active Operation and Maintenance Fee is not examined due to insufficient data.

As the previous section noted, the permit and ACF fee amounts are set close to the actual time DEP is spending on activities that are covered by the fees. DEP also reviewed the effectiveness of the fee program, both in terms of DEP's ability to implement the program and whether the system is providing the incentives originally intended for promoting timely assessments and cleanups.

To what extent do assessing annual compliance fees motivate private parties to move forward with conducting cleanup actions?				
	Greatly	**Moderately**	**Slightly**	**Unsure**
Owners/Operators	33%	33%	23%	11%

In general, few problem areas are associated with permit fees since they are not intended to provide an incentive (except to indirectly encourage risk reduction during the first year of a release's life to reduce the Tier Classification and thus potentially avoid having to apply and pay for a Tier I permit). Also, one-time compliance fees appear to be working well since they do not require DEP billing and PRPs have an incentive to pay these fees so the submittals associated with these fees will be accepted.

The results of DEP surveys show that a majority of PRPs believe ACFs provide a moderate to strong incentive for performing timely response actions. About half of LSPs, DEP staff and consultants surveyed believe fees act as an incentive.

In focus groups, DEP staff, citizens, and a number of LSPs commented that the fee amounts are not high enough to influence the speed of response actions for larger PRPs. However, stakeholders agreed that for smaller PRPs they are a factor.

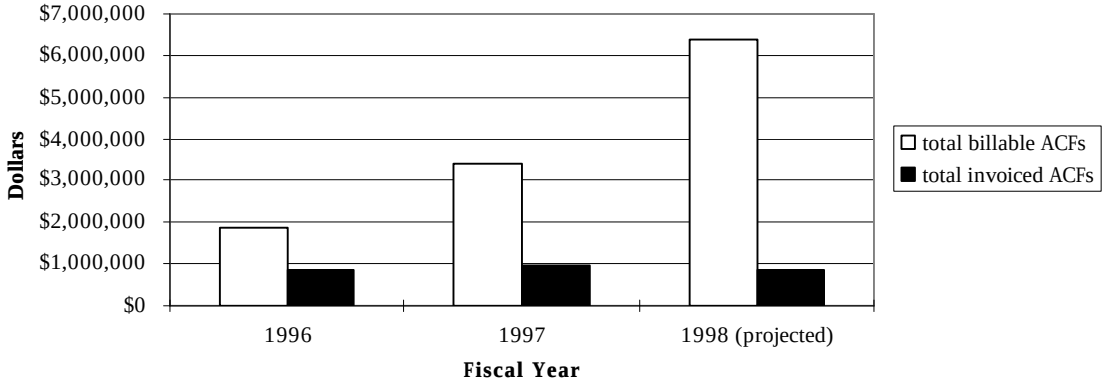
Do you believe that assessing annual compliance fees provide an incentive to PRPs to clean up their sites quickly?				
	Incentive	**Disincentive**	**No effect**	**Unsure**
LSPs	56%	2%	41%	1%
DEP Staff	49%	5%	42%	4%
Consultants	46%	4%	46%	4%

DEP did identify a number of issues regarding the effectiveness of the fee program. The primary problem areas are described below.

Billing Backlog

DEP currently has a billing backlog in certain program areas, including Tier I and II annual compliance fees and Tier IA fees. Table 3-9 presents a comparison of the total potential "billable" fees (determined by an analysis of sites in the MCP system conducting work) to the amount actually invoiced by DEP.

Table 3-9: Potential "Billable" vs. Invoiced ACFs



As the data indicates, DEP has maintained a constant rate of invoicing despite the difficulties that have been faced. The billable universe has grown significantly each year, far exceeding the resources of BWSC billing staff. It is unlikely the backlog could be addressed with current resources using existing procedures. Ideally, annual fees should be issued shortly after each billable year to reinforce the financial incentive originally intended by the fee system to encourage timely work (i.e., get out as fast as possible to pay less fees). However, the existing backlog will make this difficult.

The current billing backlog is due to a number of factors:

- MIS Issues: The computer systems available at the start of the program were not suitable for the tracking and analysis required for annual fee billing, so DEP had to create new internal programs for fee billing. An additional hurdle was added when the State Comptroller's office required all state agencies to participate in a central automated billing process. This system could not accommodate the complex joint and several liability scheme needed for BWSC fee billing, and, as a result, BWSC had to design and build its own joint and several liability module for use by the State Comptroller's Office in processing BWSC invoices. There remain significant data system gaps and incompatibilities, which compound billing difficulties.

- Detailed Billing Analyses/Default Tier IB sites: DEP initially assumed that all Tier Classified sites (including default Tier IB sites) could be billed annually. However, a closer analysis of the statute revealed that only those releases where response actions have been conducted are billable.[22] This fact created an additional level of billing analysis for all Tier Classified sites that DEP had not anticipated. The most difficult and time consuming analyses are required for default Tier IB sites. DEP does not have adequate computer tools to perform these analyses, so each site must be analyzed manually for billing, including a determination of the status (i.e. billing) date, the status of the release for each billable year, and whether response actions were performed and by whom (fees are billed to persons who conduct response

[22] Since DEP can only issue ACF invoices to parties who conduct response actions, a fundamental inequity is created -- PRPs who conduct response actions must pay fees, while those who fail to meet their cleanup obligations pay nothing.

actions, and not to all PRPs). DEP billing staff also spend a great deal of time conducting post-billing compliance assistance, which includes handling phone and written inquiries and disputes from parties that received invoices, assisting in the correction of erroneous database records, establishing payment plans, and serving as witnesses for formal fee appeals. The level of analysis required on a case-by-case basis is much greater than originally anticipated, both before and after each invoice is issued. Previous cost recovery billing only required an understanding of accounting and general BWSC program knowledge, which could be handled by non-technical staff. However, the level of detail needed for billing requires a full understanding of the technical and regulatory aspects of the MCP (including timelines and response actions), which in turn demand more technical staff involvement and attention to each individual site than was previously anticipated.

- Tier IA Billing: DEP experienced a significant delay in issuing Tier IA compliance fees due to a myriad of MIS-related problems associated with tracking DEP staff oversight charges. To issue Tier IA fee invoices, BWSC's billing unit must analyze summary time-tracking data for errors, identify errors on employee timesheets, have deficient timesheets corrected by the appropriate staff person, and re-enter data into the time-tracking system. The system is then again run, downloaded and transferred to invoices for billing. These quality control efforts require substantial effort by the billing and administrative staff. While BWSC has been unable to send Tier IA invoices over the last several years, Tier IA data from 1993 through 1997 has now been reviewed and invoices for Tier IA fees were sent in June 1998.

Options:

Although compliance fee billing will continue to be a detailed process involving individual compliance history reviews of each site, the staff with technical backgrounds over the last two years has begun to provide the correct knowledge base needed to conduct the billing analysis and provide compliance assistance to agency "customers." While significant difficulties still exist in translating site database information to billing invoices in the State Comptroller's system, other MIS improvements have been made to streamline and facilitate compliance fee billing. However, these improvements are not sufficient to properly address the volume or requirements of the current fee system.

DEP is considering several ways to improve this program component:

1. Impose a temporary "hold" on Default Tier 1B billing. Sidelining default Tier IB billing would allow staff to address other fee categories (i.e., Tier II, 1C, etc.). Of the entire "billable" universe of sites, default Tier 1B billing is by far the most time intensive due to the level of pre-billing analysis required to determine whether parties have performed response actions, and the significant post-billing compliance assistance. The default Tier 1B sites also have the lowest rate of payment and highest levels of associated disputes. Parties working on sites that have proactively Tier Classified are more likely to be familiar with the MCP process, have an awareness of applicable fees, and generally pay their bills with the least amount of compliance assistance. However, this option would be a short-

term fix and the backlog of default Tier IB sites would continue to grow unaddressed while other billing takes precedence.

2. Replace the default Tier 1B ACF with standardized enforcement actions. Given the considerable operational challenges of determining whether or not parties are conducting response actions[23], the inequity of only issuing ACFs to parties that *do* perform work, the backlog of cases requiring detailed review, and the high percentage of resulting disputes, consideration should be given to the elimination of the default Tier 1B ACF, and replacing it with standardized enforcement actions. Conceptually, providing monetary incentives to Tier Classify "on-time" has merit. Operational challenges, however, cast doubt on equitable and successful implementation of default Tier IB billing.

3. Switch to a "fixed fee" for Tier 1A Sites. Tier 1A billing is affected by the difficulties encountered in tracking staff oversight costs for each billable year. This evaluation determined an actual average ACF for Tier 1A sites of approximately $5,000 per billable year (based upon a sample universe of 52 Tier 1A sites), which could be used as the basis for a flat fee for Tier 1A sites. If implemented, Tier 1A ACFs would be invoiced in a similar fashion to other Tier I and II ACFs, without the time-consuming tabulation and analysis of technical oversight charges on a yearly basis.

4. Consider a submittal-based fee system. Forty-five percent of total fee revenue comes from the submittal of one-time compliance fees, which require minimal processing time and staff investment. While a significant amount of staff time is invested to conduct pre-billing fee applicability screening as well as post-billing compliance assistance, only 55% of total fee revenue is attributed to this "invoiced" ACF universe. Given the difficulties and significant resources intensive nature of invoicing, the continuing expansion of the billable universe, and the staff resources required to send out bills, a restructuring the fee system should be considered. This approach would lose the incentive value of fees for timely work. But, it may result in substantial resource savings for DEP, which could be used elsewhere.

   Given the difficulties encountered in development and initial implementation of the current fee system, it has yet to be fully implemented, and therefore it may be premature to restructure at this point. However, consideration could be given to a "filing" fee system based on submittals, or possibly increasing the number of one-time compliance fees and reducing the number of annual fees. Since the processing time is minimal for one-time compliance fees, adoption of a submittal based system would free up FMCRA staff to better address other billing as well as cost recovery related activities not addressed in this evaluation.

[23] Almost no default Tier 1B ACFs have been issued for Transition Sites due to the resource-intensive need to conduct a case by case file review.

Program Resources

Since the start of the new program, BWSC's state operating budget has been about $15 million each year. This money funds approximately 270 positions: 174 in BWSC and 96 in other DEP bureaus and offices (for support of the Waste Site Cleanup Program). BWSC uses bonds to fund an additional 21 positions in BWSC and 7 positions at the Office of the Attorney General.

The 1990 Study Committee report for the redesign of the 21E program estimated that 324 staff would be needed to properly implement the new program: 300 staff for DEP, 19 staff for the Attorney General's Office (for enforcement support), and 5 staff for the LSP Board.

In 1990 there were approximately 230 state-funded waste site cleanup staff and approximately 970 sites able to proceed with response actions, which was a rate of about 4 sites per staff person. DEP projected that in the new program productivity would more than double; with 300 staff, DEP estimated that 3,060 sites would be able to proceed with response actions annually, which is a rate of about 10 sites per staff person. The projections for the classification of sites assumed that 90 Tier IA, 2,320 Tier IB and IC, and 725 other sites (Tier II sites, "no further action" sites) would be open annually (Table 3-10).

The privatization of the cleanup program has exceeded the 1990 estimates. There are currently 291 state-funded staff[24] and 4,812 sites[25] which may proceed with response actions, which is a rate of 16.5 sites per staff person. The actual breakdown of existing sites is: 194 Tier IA, 436 Tier IB and IC and 4,107 Tier II and other sites (Table 3-10).

TABLE 3-10	Old Program	Projections	New Program	New Terminology
LTBIs assigned to DEP Staff	199	NA	NA	
Confirmed Sites:private sector response with DEP oversight	450	90	194*	Tier IA
Confirmed Sites: private sector response with DEP approval to proceeed	207	2320	436	Tier IB and IC
Confirmed Sites: private sector response with no prior DEP approvals needed	NA	725	4107**	Tier II, Default IB, Preclassification
Confirmed Sites: DEP response with public funds	115***	38***	70***	

* Does not include NPL sites.

** Excludes 2 and 72 hour default Tier IB and preclassified releases

*** Includes NPL sites

[24] Including 21 funded by 21E bonds.

[25] Excludes pre-classified 2- and 72-hour releases, comparable to what was considered in 1990.

The 1990 report also made assumptions about the allocation of positions to various components of the new program. Table 3-11 compares the current distribution of staff positions[26] to the 1990 projections.

TABLE 3-11*	Positions (OPERATING)	Positions (CAPITAL)	TOTAL Positions	1990 REDESIGN PROJECTIONS
BWSC				
Emergency Response	24	1	**25**	**48**
Site Discovery	6.5	0	**6.5**	**15**
Audits/Enforcement	27	3	**30**	**44**
Site Management	42.5	8.5	**51**	**33**
Permitting	7	0.5	**7.5**	**23**
Operations/Support	11	5	**16**	**0**
Response and Remediation	11	0	**11**	**9**
Planning/Program Development	13	0	**13**	**10**
Contracts	9	0	**9**	**10**
Fiscal/Cost Recovery**	23	3	**26**	**26**
SUBTOTAL BWSC	*174*	21	**195**	**218**
NON-BWSC				
Office of Research and Standards	9	0	**9**	**6**
Office of General Counsel	16	0	**16**	**25**
Bureau of Resourse Protection	10	0	**10**	**10**
Wall Experiment Station	3	0	**3**	**1**
Regional Administration	26	0	**26**	**24**
Boston Admin/Operations Support	28	0	**28**	**16**
Strike Force	4	0	**4**	**0**
SUBTOTAL NON-BWSC	96	0	**96**	**82**
TOTAL DEP	270	21	**291**	**300**
NON-DEP				
Attorney General	0	7	**7**	**19**
LSP BOARD	5	0	**5**	**5**
GRAND TOTAL	275	28	**303**	**324**
* Does not include federally-funded staff				
** Includes 2 for Assistant Commisioner				

It is difficult to make a one-to-one comparison between the 1990 projected staff needs to current staff. The work factors used in 1990 were necessarily estimates and the way the new program has been actually designed and implemented is different in many respects from what was laid out in the 1990 report. However, the following general observations can be made:

[26] Please note that "position" is not equivalent to "full-time equivalent". Some positions are filled by part-time staff. In addition, staff do not spend 100% of their time in any program area (e.g., a staff person in an emergency response position spends time on general duties, training, program development, enforcement, etc.

- Emergency Response is being staffed by about half of what was projected (25 compared to 48). With existing staffing levels, emergency response personnel limited in their ability to conduct enforcement and to provide proactive outreach on spill prevention/response to users of oil and hazardous materials (e.g., businesses, municipalities, etc.);

- Site discovery resources are about half of what was projected (6.5 compared to 15). DEP's 1994 Site Discovery Implementation Plan updated the 1990 projection to 7-9 staff. DEP is reviewing whether additional staff are needed to conduct site discovery activities in light of recommendations to focus efforts on new areas of inquiry.

- Permitting is being staffed by about one third of the projected staff needed (7.5 compared to 23). The current staffing level is sufficient for current permit volume; however if recommended changes to the Numerical Ranking System are made which result in a higher volume of Tier I permit applications, current resources will need to be reevaluated.

- Audits and enforcement is being staffed by approximately two-thirds of what was projected (30 compared to 44). However, the current staff level does not allow DEP to fully implement the recommendations made by Techlaw for revising the audit program and greatly limits DEP's ability to take enforcement against PRPs who refuse to meet their cleanup obligations.

- BWSC funds 16 attorneys in DEP's Office of General Counsel and 7 staff at the Attorney General's Office, which is significantly less than the number projected in 1990 (25 attorneys in DEP and 19 at the AG). This also limits DEP's ability to pursue enforcement actions and address backlogs.

- BWSC's contribution to Boston and regional administrative and operations support is higher than predicted (54 compared to 40), although this contribution is in line with what other DEP bureaus are contributing.

The 1990 report recognized that in the redesigned program there would be backlogs in certain areas, which has proven to be the case:

- Sites Requiring Permits. DEP estimated that it would not have the resources to "call permits" for about 370 sites each year, which would result in an accumulating backlog over time. This backlog is somewhat analogous to the backlog of over 1,500 default Tier IB sites.

- Oversight of Tier IA sites. DEP estimated that it would be able to oversee only 90 of the 250 Tier IA sites that were projected to need attention in the new program. There are currently 194 Tier IA sites. While only 23 are formally not assigned to a project manager, staff are limited in their ability to take proactive steps, including enforcement, to push PRPs who are not moving forward expeditiously.

- Managing Publicly Funded Sites. DEP estimated only being able to work on 38 of 45 high priority sites requiring state action each year, and estimated a backlog of 180 less complex sites which should be publicly funded by the time the program was fully operational (five years after start -- i.e., 10/1/98). DEP's public funding of response actions has been limited by state-imposed caps on capital spending as well as the lack of project managers to oversee publicly funded sites.

A fourth unforeseen area where lack of resources has resulted in backlogs is billing annual compliance fees. As discussed above there is a significant backlog in billing for sites required to pay annual compliance fees, particularly for default Tier IB sites.

Homeowner Issues

As part of the program evaluation, DEP solicited comments on how privatization of the cleanup program has affected PRPs. DEP received numerous comments that homeowners had a particularly hard time dealing with releases from home heating oil tanks.

DEP considers "homeowner" releases as those occurring at one- to four-family owner-occupied residential properties. Leaks from fuel oil systems (either fuel lines or tanks) are the most common problem faced by homeowners. The cost of cleaning up a fuel oil release can vary widely. Most cleanups involve excavation and removal of contaminated soils. If groundwater is affected, costs can be even higher. Cases costing over $50,000 are not uncommon.

DEP staff, LSPs, citizens and others have all commented that homeowners have had an especially difficult time in the new program due to lack of financial resources and sophistication in dealing with the MCP:

- Homeowners are at a unique disadvantage because they have fewer financing sources available to them. Stakeholders overwhelmingly stated that financing cleanups is especially difficult for homeowners. A number of homeowners who responded to DEP's survey stated that underground storage tank removal and cleanup costs were in the $50,000 range. Several respondents noted that the added cost of LSP involvement could account for up to 60% of the total cost in some cases. Banks are reluctant to loan money for cleanup or refinancing because of uncertainty about risks and future cleanup costs, and because most homeowners do not have substantial assets in addition to their homes to use as collateral for loans. Financial constraints often result in homeowners hiring LSPs with the lowest bids. Unfortunately, the lowest bid may not always end up as the lowest final price. For example, a homeowner was quoted a bid of $1,500 for a component of a cleanup received a bill for $9, 130 for the performance of the services.

  Homeowner's insurance doesn't always cover cleanup costs, especially when the release is a "first-party" release (i.e., affecting only the homeowner's property). Homeowner policies typically include a "pollution exclusion" clause, exempting them from any coverage for pollution cleanup except where a third party is threatened or damaged. In addition, it takes at least one year to process insurance claims. As a result, homeowners often miss the one-year

deadline to Tier Classify and incur a default Tier IB fee of $2,600 (there are currently 168 residential sites in a default Tier IB status). Even when a homeowner site is cleaned up within the one year deadline, a $750 RAO fee applies if the RAO is filed greater than 120 days from release notification. Homeowners are not always aware of these fees, or of ways that they can be avoided - either because it was not explained to them or because they did not understand the requirements. Some stakeholders have made the point that money used to pay MCP fees diminishes the already limited resources available to pay for cleanup.

- Homeowners have difficulty understanding the MCP and working with LSPs. A number of homeowners commented that they are "at the mercy" of LSPs. While many LSPs are conscientious and helpful, homeowners and other stakeholders have reported that some LSPs take advantage of homeowners and perform more work than is needed. Most homeowners do not have access to technical resources. While many commercial PRPs have more than one site, staff experienced with environmental regulations, and referrals from colleagues or industry associations, homeowners are in a one-time situation with no experience to rely on.

  A number of stakeholders, including LSPs, believe that DEP should oversee homeowner sites. While DEP already provides some assistance to homeowners, the level of involvement varies. Staff involvement typically involves helping the homeowner and LSP define the work that is necessary (as a way to contain unnecessary costs), identifying and involving other Potentially Responsible Parties (PRPs), and assisting the homeowner in dealing with lenders and insurers. However, this involvement is subject to the availability of DEP staff. DEP resources are limited and do not allow DEP involvement in all cases.

Options:

Actions which DEP could take to assist homeowners fall into three major categories: outreach/guidance, regulatory changes, and financial assistance.

Outreach/guidance:

- Work with the LSP Association to create a "Homeowner Referral List" of LSPs who are willing to take homeowner cases.

- Work with the LSP Association to develop descriptions of standard or generic cleanup actions (including cost ranges) to aid homeowners in evaluating LSP and contractor estimates and bills.

- Provide more user-friendly guidance to homeowners as soon as they come into the system describing the MCP program and regulatory requirements.

Regulatory Changes

The following regulatory changes would assist homeowners:

- Simply for the NRS scoring required for Tier Classifications.

- Clarify when Remedy Operation Status could apply prior to Tier Classification so that sites with ongoing remediation (e.g., bioremediation) would not have to Tier Classify.

- Waiving or reducing MCP compliance fees (especially for relatively low risk situations) for 1-4 family homeowner properties. For example, eliminate RAO, RAM and Downgradient Property Status fees.

Financial Assistance:

DEP believes that a partnership with the private sector could be formed to work toward better insurance coverage and increased access to funding for homeowners. DEP believes that a work group should be convened involving insurance companies, banks, the oil industry, and other stakeholders to explore options for expanding homeowner insurance coverage, increasing access to loans, and possibly establishing a Homeowner Cleanup Assistance Fund providing reimbursement to homeowners for cleanup costs. Such a fund could be similar to the Chapter 21J Leaking Underground Storage Tank Trust Fund established for commercial tanks.

Chapter 4: Are DEP's Standards Set Appropriately?

The new program is considered to be a "risk-based" program, meaning that the decision to remediate a site and the extent of remediation needed is based upon consideration of the health, environmental, safety and public welfare risks posed by the site.

The 1992 changes to M.G.L. Chapter 21E which resulted in the new program did not change the basic remedial goals of the Act. These include the requirement of a condition of "No Significant Risk" of harm to health, safety, public welfare and the environment as the minimum level of cleanup for a permanent solution[27], and that, where feasible, remediation continue beyond the No Significant Risk level to approach or achieve background conditions.[28]

While the statute provides general definitions of what background and No Significant Risk mean, it is left to DEP to develop the regulatory tools which operationally describe these terms. Under both the 1988 and the 1993 MCP, the term "*condition of No Significant Risk*" is taken to mean a site-related exposure which, given the state-of-the-art in the science of risk assessment, would result in no adverse noncancer health effects and a low (a one-in-one hundred thousand chance, or less) likelihood of developing cancer. Recognizing that there are significant limitations in our ability to estimate potential exposures and quantify health risks, the regulations incorporate qualitative risk-reduction elements (e.g., approaching or achieving background) to minimize future risks to health, safety, public welfare and the environment.

This chapter of the GEIR summarizes the statutory and regulatory requirements related to site cleanup, compares the requirements of the 1988 and 1993 MCP, and evaluates the effectiveness of the 1993 MCP.

A. Description of 21E/MCP Cleanup Requirements

1. Statutory Requirements

Table 4-1 summarizes the cleanup requirements incorporated in the M.G.L. Chapter 21E, including both the quantitative and qualitative approaches to risk reduction. The regulatory tools developed to implement these requirements under the 1988 and 1993 MCPs are described in the following sections.

[27] M.G.L. Chapter 21E §3A(g)
[28] Ibid.

Table 4-1

Summary of M.G.L. Chapter 21E Cleanup Requirements

c.21E Section	Concept	Summary
Section 3 (d)	DEP regulatory authority	DEP shall consider at least the following: (1) the existence, source, nature, and extent of a release or threat of release of oil or hazardous material in question; (2) the nature and extent of danger to public health, safety, welfare, and the environment (3) the magnitude and complexity of the actions necessary to assess, contain, or remove the oil or hazardous material in question; ...
Section 3A(d):	DEP regulatory authority	In the Massachusetts Contingency Plan, the department shall establish standards, procedures and deadlines...to ensure that response actions are taken in compliance with the provisions of this chapter and the Massachusetts Contingency Plan as expeditiously as practicable
Section 3A(e)	Imminent Hazards	If significant evidence exists at any time of an imminent hazard to public health, safety, welfare, or the environment...[DEP] shall immediately ensure...that, at a minimum, action is taken to control the potential for health damage, human exposure, safety hazards and environmental harm through appropriate short term measures...
Section 3A(g):	Achieve Permanent Solution[29]	At each site, one or more permanent solutions to the extent feasible shall be implemented as necessary to achieve a level of no significant risk.
	Achieve No Significant Risk	No site shall be deemed to have had all the necessary and required response actions taken for such site unless and until a level of no significant risk exists or has been achieved in compliance with this chapter.
	Define Permanent Solution	A ***"permanent solution"*** is defined as "a measure or combination of measures that, at a minimum, shall ensure the attainment of "no significant risk".
	Define No Significant Risk	***"No significant risk"*** is defined as "a level of control of each identified substance of concern at a site or in the surrounding environment such that no such substance of concern shall present a significant risk of damage to health, safety, public welfare, or the environment during any foreseeable period of time.
	Risk Assessment	"in determining whether a permanent solution will achieve a level of no significant risk, the Department [must] consider existing public health or environmental standards where applicable or suitably analogous, and any current or reasonably foreseeable uses of the site and the surrounding environment..."
	Approach or Achieve Background	"Where feasible, a permanent solution shall include a measure or measures designed to reduce to the extent possible the level of oil or hazardous materials in the environment to the level that would exist in the absence of the disposal site of concern."

[29] Note that when it is not feasible to implement a Permanent Solution, a Temporary Solution, which eliminates any Substantial Hazards at a site, is implemented (§ 3A(f)).

2. Regulatory Requirements

This section summarizes the remediation requirements under the old (1988) and current (1998) regulations. This background information will form the basis for an evaluation of the effectiveness of the current MCP in comparison to the 1988 regulations.

a. Former (1988) MCP

The risk characterization requirements of the 1988 MCP were found at 310 CMR 40.545. DEP published final risk characterization guidance to support these regulations in early 1989.

i. Human Health Risk

There were four methods for characterizing **human health risks** as described in Phase II of the 1988 MCP. These methods were labeled Methods 1, 2, 3.a, and 3.b and are summarized in Table 4-2. The four separate methods for characterizing health risks and identifying clean-up requirements had been criticized as cumbersome, confusing and perhaps inconsistent.

The four risk characterization methods and associated risk management criteria were developed during 1987 and 1988. The US EPA was developing and using some approaches that addressed the additivity of risks from multiple chemicals and multimedia exposures in risk assessments for Superfund sites. At the time, it seemed that the total site risk concept should be incorporated into the c. 21E sites program in order to be consistent with the direction that the federal Superfund program was taking and the state of the art of risk characterization in 1988. In addition, it made sense to assess disposal sites as a whole, rather than as a collection of discrete units or contaminated media. Ultimately DEP was concerned about the cumulative impact the site was having on the health of potentially exposed individuals. However concerns were raised about the consistency of using a total site risk approach for c. 21E while other DEP regulatory programs utilized chemical-specific regulations.

ii. Safety, Public Welfare and the Environment

The 1988 MCP required that the risk of harm to safety, public welfare and the environment be evaluated. No detailed requirements were contained in the regulations and no methodology was developed in guidance.

iii. Background

At sites where a remedial action was required based upon a risk characterization, measures to reduce the concentrations of oil or hazardous material to levels which would exist in the absence of the disposal site of concern (background) were required.

Table 4-2

1988 MCP Human Health Risk Characterization Methods

Method	Applicability	Risk Characterization Approach
1.	When there was a promulgated standard that was applicable or suitably analogous for each OHM at each current and reasonably foreseeable exposure point	Comparison of exposure point concentrations to applicable or suitably analogous public health standards
2.	When there was a promulgated set of cleanup levels which were applicable for the site pursuant to 310 CMR 40.800. (No such sets of cleanup levels were ever promulgated)	Comparison of exposure point concentrations to applicable set of cleanup levels.
3.a	When neither Method 1 nor Method 2 applied and if OHM were likely to be transported to exposure points through only one medium (single medium sites)	Comparison of exposure point concentrations to (in order of precedence): (1) Applicable or suitably analogous public health standards; (2) Public health or risk-based guidelines or policies approved by the Department; or (3) Public health or risk-based guidelines proposed by the PRP
3.b	When neither Method 1 nor 3.a applied and the PRP chooses not to use Method 2. Intended for sites where OHM were transported to exposure points through more than one medium (multi-media sites)	Comparison of exposure point concentrations to applicable or suitably analogous public health standards and comparison of total site cancer risk to one-in-one hundred thousand and non-cancer risk to a Hazard Index = 0.2.

b. Current (1998) MCP

The current regulations provide three options for characterizing the risk of harm to health, safety, public welfare and the environment. **Method 1** uses clear numeric standards for more than 100 common chemicals in soil and groundwater; **Method 2** allows for some adjustments in these standards to reflect site-specific fate and transport considerations; and **Method 3** allows cleanup requirement goals to be defined on the basis of a site-specific risk assessment. In addition, the regulations provide additional tools to address the qualitative risk reduction requirements of the statute, including the need to expeditiously

address migrating contamination (Substantial Release Migration), to eliminate continuing sources and to approach or achieve background conditions.

i. Human Health

Under Methods 1 and 2, the risk of harm to human health is evaluated by comparing environmental concentrations of oil or hazardous material to standards promulgated in the MCP. In general, each standard is targeted to quantitative risk-based health criteria (a Hazard Index = 0.2 for noncancer risk, an Excess Lifetime Cancer Risk = one-in-one million for cancer risk), although the standard-setting process[30] also incorporates background concentrations, quantitation limits and ceiling values, non-quantitative, risk-based criteria, which must also be considered. The numerical value of the standard for a given chemical may be based upon any one or a combination of these factors.

Under Method 3, the risk of harm to human health is estimated based upon site-specific exposure assumptions which consider current and future site activities and uses. The estimated noncancer and cancer risks are compared to the MCP Risk Limits of a Hazard Index = 1 and an Excess Lifetime Cancer Risk = one-in-one hundred thousand. In addition, any promulgated health-based standards that are applicable or suitably analogous must be met, and Upper Concentration Limits are applied to limit future unquantifiable health risks.

ii. Safety

Regardless of the risk characterization Method employed, the risk of harm to safety must be addressed separately (310 CMR 40.0960). Safety risks related to c.21E sites include dangerous structures (such as open pits and lagoons), threats of fire or explosion (including the presence of explosive vapors) and uncontained corrosive, flammable or reactive material.

iii. Public Welfare

Under Methods 1 and 2, the generic standards are considered to be protective of public welfare concerns. In addition to the risk-based criteria considered in the development of the standards, no Method 1 standard is allowed to exceed defined "ceiling values". These ceiling values are employed to address general public welfare concerns (such as odors from soil or groundwater and the taste of drinking water) as well as to address unquantifiable health and environmental risk concerns.

Under Method 3, the risk of harm to public welfare must be addressed explicitly (310 CMR 40.0994). The evaluation includes consideration of "nuisance

[30] SEE the MA DEP publication *Background Documentation for the Development of the MCP Numerical Standards*, April 1994

conditions, loss of property value, the unilateral restriction of the use of another person's property, and any monetary and non-pecuniary costs not otherwise considered in the characterization of risk of harm to health, safety and the environment..." DEP has not published detailed guidance on how to conduct an evaluation of the risk to public welfare, but has made some limited recommendations in other policy documents (e.g., the Implementation Guidance for the VPH/EPH Method). In addition, Upper Concentration Limits are applied as public welfare standards to address the unquantifiable, long-term risks associated with high levels of residual contamination in the environment.

iv. Environment

Under Methods 1 and 2, future environmental impacts to surface water are addressed through the GW-3 groundwater standards, which were developed considering US EPA Ambient Water Quality Criteria and similar values. Method 1 cannot be used at sites with contamination in ecologically sensitive media (sediment, surface water and in some soils).

Under Method 3, a site-specific ecological risk characterization consists of two stages. A Stage I Screening assessment is conducted to screen out sites which are unlikely to pose significant environmental risk, or to quickly characterize sites with obvious significant environmental problems. A Stage I screening employs published environmental criteria and an evaluation of possible exposure pathways. A comprehensive Stage II assessment is required to evaluate sites with complex environmental problems which cannot be addressed using simple screening criteria. Stage II assessments may make use of concentration-based comparisons to published criteria or benchmark concentrations from the primary literature, and site-specific assessments such as toxicity tests or populations studies. Upper Concentration Limits are also employed as environmental standards to address the unquantifiable long-term risks associated with high levels of residual contamination in the environment.

v. Background

Regardless of the risk characterization Method employed, if remediation is required at a site, then the reduction of site contaminant concentrations beyond risk-based levels to approach or achieve "background" levels is required (310 CMR 40.1020) where feasible. Given the acknowledged limitation of risk assessment to accurately and definitively describe potential risks posed by environmental contamination, the reduction of contaminant concentrations to "*levels which would exist in the absence of the disposal site of concern*" is the only certain means to permanently eliminate risks to health, safety, public welfare and the environment.

It is important to note that this background requirement is not an all-or-nothing requirement: any reduction in environmental contaminant concentrations beyond the quantified risk-based levels would serve to lower overall risk. It is not necessary to actually achieve background to benefit from this requirement.

c. Comparison of 1988 and 1993 MCPs

The primary criticisms of the risk characterization methods employed in the 1988 MCP include:

- The risk characterization methods were too complicated and determining the need for (or the adequacy of) remediation was too time-consuming and expensive;
- The applicability of the four methods was unclear. In particular, it was unclear when Method 3.a vs. 3.b applied;
- Method 1 was rarely implemented because situations where a promulgated standard existed for all hazardous materials found at a site were uncommon; Method 2 had never been implemented because specific sets of cleanup levels had not been developed.
- Even though guidance existed for the use of the human health risk characterization methods, the results of risk characterizations were neither predictable nor consistent.
- No practical regulations or guidance existed for the evaluation of safety, public welfare or environmental risks, resulting in inadequate assessments and few (if any) remediations based upon these factors.

In 1992, as a result of the criticisms raised about the 1988 regulations, the following objectives were developed in order to guide the development of the 1993 MCP:

- **Simplify the characterization of health risk to determine the need for remediation and the identification of remedial goals while retaining some flexibility provided by the focus on cumulative (total) risk.**

  The generic standards promulgated in 1993 as Method 1 have no 1988 equivalent, although there was an unrealized effort to publish sets of cleanup standards for different types of sites (e.g., petroleum, coal gasification waste and PCB sites). The target risk criteria for the medium- and chemical-specific standards are set significantly lower than the Method 3 Cumulative Risk Limits to allow for multi-media and multi-chemical exposures to occur at a site.

The site-specific Cumulative Risk Limits under the two MCP versions are roughly equivalent, the only difference being that in 1993 the Cumulative Noncancer Risk Limit was raised from a Hazard Index equal to 0.2 to 1, which is consistent with the US EPA and other agencies. A Hazard Index equal to 1 for a site indicates that the estimated site exposure is equal to an exposure considered unlikely to result in noncancer health effects. The previous value (0.2) was established as a conservative measure in consideration that people may also be exposed to the same chemicals from non-site related sources (e.g., inhaling benzene while pumping gasoline). It was questionable whether consideration such non-site exposures was consistent with the statutory requirements and whether such a difference would be statistically significant. DEP believes that, in concept, this change did not lessen the protectiveness of the regulations and that the resulting risk standard is more consistent with the language of the statute. In practice, 62% of DEP staff surveyed believe that the new standards are at least as protective as under the old program.

Table 4-3

In the new 21E program, are the cleanup standards more protective, less protective, or the same as under the old program?[31]

	More Protective	The Same	Less Protective
LSPs	63 %	26 %	6 %
DEP Staff	41 %	21 %	33 %

- **Clarify the applicability of the risk characterization methods**.

  The criteria for determining which risk characterization Method applies has been simplified. Site-specific risk assessment is always an option, and generic standards are available for use as long as the contamination is limited to soil and groundwater and there is no additional environmental concern.[32]

[31] Please note that the percentages in this and subsequent tables of survey results represent the percentage of LSPs, DEP staff and consultants who responded to the survey. The values do not necessarily add up to 100% as some responders did not answer certain questions (e.g., in Table 4-3, 5% of DEP staff responding to the survey did not answer this question). In Appendix A, which gives all the survey results, people who failed to answer a particular question are listed as "Unsure".

[32] i.e., bioaccumulating chemicals in the top 2 feet of soil and there are environmental receptors of concern at the site. See 301 CMR 40.0942.

- **Assure that risk characterization methods maintain the protection of public health.**

Table 4-4

Do you believe that cleanups in the new program are more protective of health, safety, public welfare and the environment?			
	More Protective	No Change	Less Protective
LSPs	41 %	46 %	11 %
DEP Staff	23 %	26 %	44 %

DEP staff and LSPs believe that the level of protectiveness of the cleanup standards are at least as protective as under the old system. However, since there were no generic (Method 1) standards under the old system a direct comparison is difficult. Interestingly, while the majority (63%, Table 4-3) of LSPs believe the standards are more stringent, a similar number (57%[33], Table 4-4) also believe that the actual cleanups achieved at sites are no more protective than under the old rules.

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- **Develop practical requirements for the evaluation of safety, public welfare and environmental risks.**

The 1993 regulations provide far more detail for the evaluation of safety and public welfare risks. DEP's experience implementing the 1988 MCP indicates that safety and public welfare concerns were addressed at very few sites. The inclusion of explicit requirements in the 1993 regulations is a vast improvement.

Prior to the 1993 MCP revision, the regulations and guidance contained only minimal statements regarding environmental risk assessment requirements. The 1993 regulations outline a process for conducting environmental risk assessments and for using the results as a basis for site management decisions. These regulations represent an improvement over the 1988 regulations in several respects. First, they demonstrate that DEP will enforce the statutory requirement to demonstrate or ensure that a waste site does not pose significant risk of harm to the environment. Previously, the requirement was not addressed in many site assessments. Second, they provide a clearer indication of the nature and types of assessments DEP intended. Until 1993 most of the environmental risk assessments that were done were cursory. Finally, the revised regulations establish a tiered approach in which the first stage is a screening step. This approach allows risk assessors to eliminate from further consideration those sites or portions of sites that are unlikely to pose a significant risk, thus enabling DEP and the regulated community to focus assessment and remediation resources on the most serious sites.

[33] 57% is the sum of the "Less Protective" and "No Change" responses.

Qualitative Risk Issues

The 1993 regulations provide additional tools to address the unquantifiable risks posed by environmental contamination. First, the requirement to continue remedial actions to approach or achieve site background conditions, where feasible, has been carried over from the 1988 MCP and the statute. Second, in order to "*ensure that response actions are taken...as expeditiously as possible*" to control both quantifiable and unquantifiable risks, DEP promulgated regulations to address Substantial Release Migration. In addition, in order to minimize the likelihood of neglecting/overlooking unquantifiable but significant risks due to the limitations of the science of risk assessment, the 1993 regulations implemented limits (or ceilings) on the value of the generic Method 1 standards; Upper Concentrations Limits, which set an upper bound on allowable residual contamination when using Method 3; and a requirement to eliminate any continuing source of contamination in order to qualify for a Response Action Outcome. When properly implemented, these tools provide additional protection of health, safety, public welfare and the environment.

B. Description of Cleanups Under the New MCP

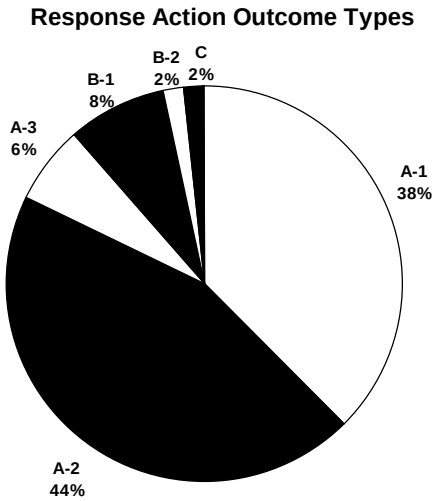
In evaluating whether the cleanups of disposal sites are meeting the statutory and regulatory requirements, we must examine whether remedial actions are being implemented, if appropriate, and the nature, extent and effectiveness of such actions. It should be remembered that not all sites require remediation, and one question to be investigated is whether such sites can quickly make such a demonstration and get out of the regulatory system.

1. Response Action Outcome Statistics and Implications

a. Types of Response Action Outcomes

The Response Action Outcome (RAO) is the endpoint for site investigations and remediations conducted under the 1993 regulations. The RAO is the equivalent to a determination that No Further Action is needed to address potential risks and residual

Figure 4- 1

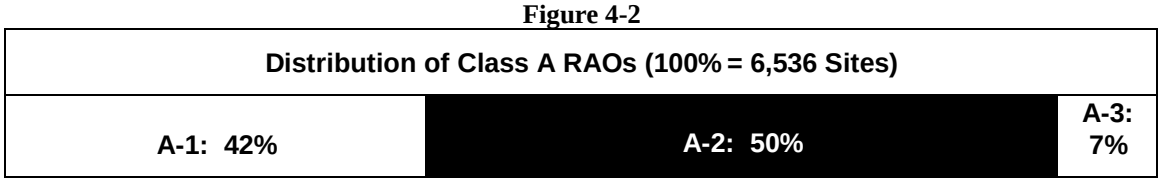


contamination at a disposal site. Recognizing that there could be numerous reasons why no further action is required at a site, three broad RAO categories and several sub-categories were created to better describe a site's final status.

i. Class A RAOs

Sites are eligible for a Class A RAO if one or more remedial measures were actually implemented to achieve the No Significant Risk standard. Approximately 89% (6536/7381) of the RAOs received are Class A RAOs, indicating that remedial measures were taken at most of the sites getting out of the system. The high rate of Class A RAOs is good evidence that the MCP Reportable Concentrations are effectively screening in sites which are likely to pose significant risk and require cleanup.

Figure 4-2



Because remedial actions have been implemented at these sites, the statute requires that remedial actions continue beyond the No Significant Risk levels to approach or achieve background. In fact, background levels were achieved at 42% (2,774/6536) of the sites subject to this obligation.[34] A Class A-1 RAO applies to this subgroup of sites. It is not clear how many additional sites were remediated to levels "approaching" background.

At a majority (50%, or 3288/6536) of sites receiving Class A RAOs, remediation was conducted to achieve a condition of No Significant Risk assuming unrestricted use of the site. A Class A-2 RAO applies to this subgroup of sites. When combined with the Class A-1 RAOs, at 92% of the sites where remediation occurs the resulting site is clean enough for unrestricted (including residential) use.

At 7% (or 474/6536) of the sites receiving a Class A RAO, Activity and Use Limitations (AULs) were employed to limit future site use and allow for less stringent cleanup requirements. It is important to note that the No Significant Risk standard must still be met at such sites, but that the risk assessment has been tailored to site-specific conditions which do not allow for unrestricted use of the property. (AULs are discussed in more detail below.) Thus, while remediation did take place, the extent of cleanup fell short of that required for unrestricted use of the property. A Class A-3 RAO applies to this subgroup of sites.

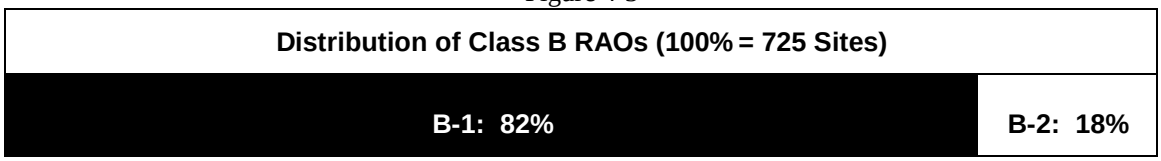
[34] Sites receiving a Class B or C RAO do not need to consider the feasibility of achieving background. Including these sites into the total, 38% of all sites have achieved background.

On May 30, 1997, the MCP was revised to create a Class A-4 RAO category under which, in limited circumstances, soil containing contaminant concentrations greater than the Upper Concentration Limits could remain on-site untreated. No data is currently available for this RAO category.

ii. Class B RAOs

Sites are eligible for a Class B RAO if it is demonstrated that a condition of No Significant Risk exists without the implementation of remedial measures. In other words, these are sites which may be contaminated, but the contamination is not significant enough to warrant cleanup. Only 10% (725/7381) of the sites receiving RAOs fall into this category, indicating that the MCP Reportable Concentrations (RCs) are not bringing insignificant sites into the system. While no data are available on the number of sites for which DEP does not receive notification, 88% of LSPs[35] believe that the RCs are keeping most or some of the "non-problem" sites out of the system.

Figure 4-3



The majority (82%, or 596/725) of the sites which achieve an RAO without conducting remediation have site conditions acceptable for unrestricted use of the property. A Class B-1 RAO applies to this subgroup of sites. When combined with the information on Class A-1 and A-2 RAOs, 90% (6628/7381) of the sites receiving RAOs are clean enough for unrestricted use of the property.

At a small number of sites which achieved an RAO without remediation (18%, or 129/725), the conclusion that no remediation is necessary to achieve a condition of No Significant Risk is predicated on assumptions which limit the future use of the property. An example of a site in this category would be an industrial site with low levels of contamination which would be unacceptable for residential use, but which would pose No Significant Risk as long as the property remains industrial. A Class B-2 RAO would apply to sites in this subgroup.

On May 30, 1997 the MCP was revised to include a Class B-3 RAO category under which, in limited circumstances, soil containing contaminant concentrations greater than the Upper Concentration Limits could remain on-site untreated. No data is currently available for this category of RAO.

iii. Class C RAOs

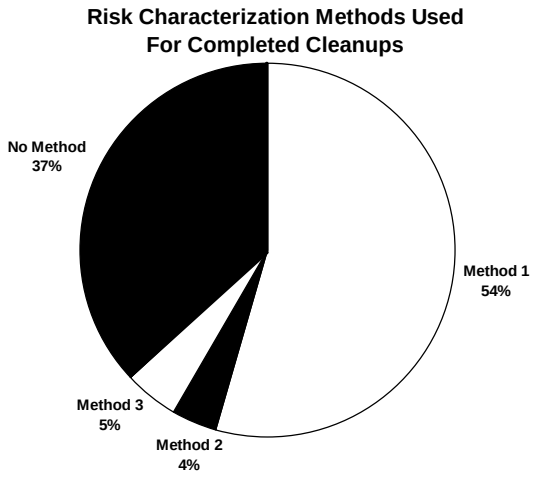
[35] Only 14 of the 127 LSPs (11%) responding to a survey believed that few "non-problem" releases are kept out of the system.

Sites are eligible for a Class C RAO if it is not feasible to implement a permanent solution at the site and if the site conditions do not pose a Substantial Hazard.[36] Until recent changes to the regulations created the Remedy Operation Status, Class C RAOs were the only achievable endpoint at sites where long-term remedial actions (such as groundwater treatment) were implemented with the goal of eventually achieving a Class A RAO. No data are available to identify what percentage of the Class C RAO sites were actually in the process of implementing permanent solutions. Only 2% (120/7381) of all sites receiving RAOs fall into the Class C RAO category, indicating that it is usually possible to implement a Permanent Solution at a site. However the percentage of Class C RAOs will likely rise in the future, as sites reach the 5-year limit.[37] This is particularly true for sites with groundwater contamination which exceeds the GW-1 standards and at sites with NAPL.

b. Risk Characterization Methods Used

With some limitations[38], the selection of Risk Characterization Method employed at a site is the option of the PRP and LSP. A site-specific risk characterization is *always* an option, and DEP has found that most LSPs use the three Methods sequentially. (Method 3 is selected only when Methods 1 and 2 cannot be used to demonstrate No Significant Risk.)

Figure 4-4



The goal in rewriting the risk characterization section of the MCP in 1993 was to streamline the assessment process, achieve more consistent site cleanups and provide the PRP with predictable goals to better estimate the resources needed to remediate a site. At the same time, DEP wanted to maintain the flexibility of the site-specific risk assessment, which allows a PRP to tailor remediation goals to the characteristics of the site.

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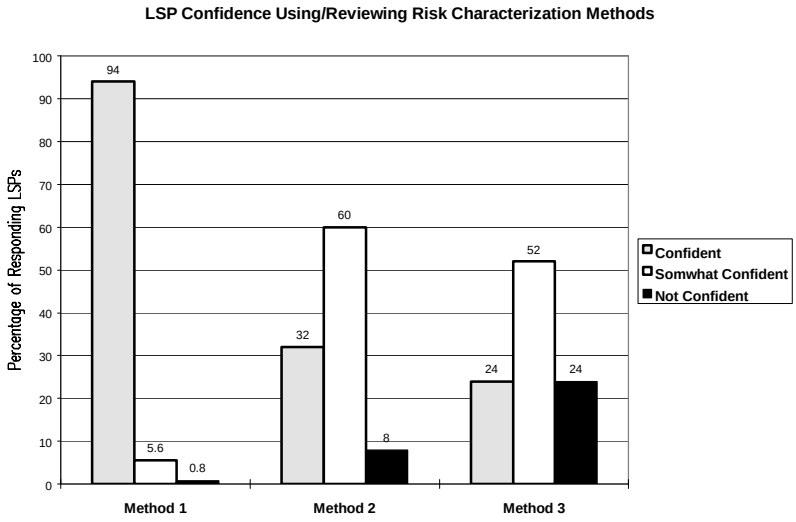
[36] A Substantial Hazard is a hazard which would pose a significant risk of harm to health, safety, public welfare or the environment if it continued to be present for several years (M.G.L. c.21E §2). See Section 4.C.3. of this GEIR for a more detailed discussion of substantial hazards.

[37] Generally a site must achieve an RAO, Downgradient Property Status or Remedy Operation Status 5 years after Tier Classification.

[38] Methods 1 and 2 cannot be used alone when there is contamination present in media other than soil and groundwater. In some cases a Method 3 Environmental Risk Characterization may be combined with a Method 1 (or 2) evaluation of health and public welfare risks.

Overall, at 91% of the sites which have achieved a Response Action Outcome the LSP has demonstrated that a condition of No Significant Risk exists using generic approaches. This includes sites where remediation has restored background conditions and no risk characterization was necessary (37%, or 2281/6166 sites) and sites where a Method 1 risk characterization was employed (54%, or 3359/6166). It is DEP's experience that the Significant Risk demonstrations at most of these sites are conducted without the input of trained risk assessors. This was anticipated in 1993 and the regulations written to facilitate the use of the streamlined approach by the LSP community. At the time DEP estimated that 75% of the site risk characterizations would be conducted using Method 1 or with a background demonstration. The 91% figure surpasses those expectations.

Figure 4-5



At only 4% of the sites (234/6166) was a Method 2 approach employed either to modify the Method 1 standards considering site-specific fate and transport issues or to develop new "Method 2" standards for chemicals which do not have DEP-developed Method 1 values.

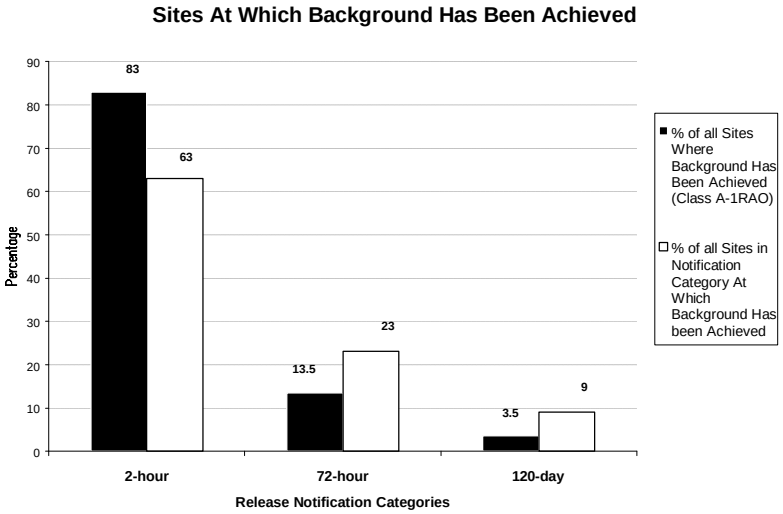
Finally, at only 5% of the sites (292/6166) was a site-specific Method 3 assessment used to demonstrate No Significant Risk. Many of these are, in fact, a simple "No Exposure - No Risk" demonstration with a comparison to Upper Concentration Limits. This is "site-specific" risk assessment (requiring minimal documentation) is often used at sites with residual soil contamination located under buildings or at depth.

The use of the three risk characterization Methods is consistent with the confidence LSPs have in their ability to use or review each approach. As indicated in Figure 4-5, more than 90% of LSPs feel "Confident" using Method 1, while only 24% feel confident in using site-specific risk assessments (Method 3).

c. Achievement of Background

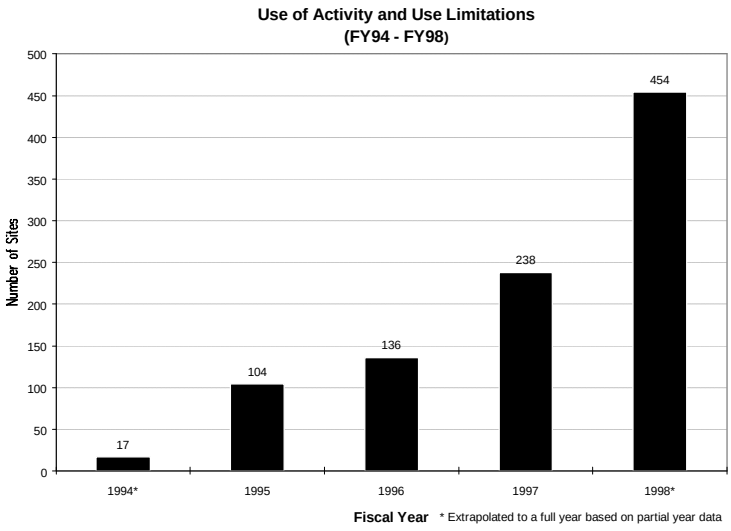
Figure 4-6

As noted previously, 38% of all sites and (42% of all sites requiring remediation) have completed work under the MCP having attained background conditions. A substantial fraction (83%) of all the sites at which background was achieved entered the system as 2-hour notifications. It is not surprising to find that achieving background is more feasible when cleaning up a sudden release of oil or hazardous material - 63% of all 2-hour notifications were cleaned to background. For historic releases (120 day notifications), the fraction of sites which were cleaned to background is much smaller: 9% of all 120-notifications, representing only 3.5% of the sites attaining background conditions. As would be expected, the statistics for 72-hour notifications fall in the middle (23% of 72-hour notifications, which represents 13.5% of all sites attaining background).



d. Use of Activity and Use Limitations (AULs)

Figure 4-7



AULs are used at sites where the cleanup has made the site conditions acceptable for the current use and certain, *but not all*, future uses. The AUL are deed notices or restrictions which specify the allowable and prohibited activities for a site. AULs are an innovation of the 1993 regulations and DEP received numerous comments at the time indicating that lending institutions and property owners would be reluctant to accept land use restrictions as part of a site cleanup. Indeed, the use of AULs was slow at first, but has picked up in the last several years (possibly as the result of increased acceptability to commercial/industrial PRPs and lenders. Anecdotal evidence indicates that homeowners continue to be reluctant to employ AULs). The use

of AULs have increased 228% from 1995 to 1997, as indicated in Figure 4-7. The effectiveness of AULs as a regulatory tool is discussed in Section 4.D.2.

2. Remediation Issues

a. Soil Remediation.

As noted in Chapter 1, Contaminated Soil Management Options, excavation and off-site management of contaminated soil is the most common cleanup strategy employed at sites in Massachusetts. Excavation of contaminated soil is particularly effective at smaller sites at which the costs for removal and treatment/disposal of soil is manageable. Additional soil remediation strategies involve bioremediation, soil vapor extraction and capping.

LSPs have noted that there is more use of innovative technologies under the new program than under the old system, in particular bioremediation. Clients appreciate (and are surprised by) the flexibility in this area.

In Focus Groups, DEP staff noted that they are seeing a significant amount of soil excavation and source removal. However, some DEP staff expressed concerns that they are seeing "mostly capping of contamination. There is a lot of room to manipulate the system and do as little as possible." These staff believe that in the old program there were more actions that removed contamination from the environment. (Capping may be relatively more common at complex sites with DEP involvement, as it may be the most cost-effective approach where there is consistent, widespread contamination or contamination at depth.)

Options:

1. Continue to evaluate soil remediation strategies and enforce current MCP rules, with no significant changes.
2. Strengthen feasibility evaluation criteria to minimize capping-in-place.
3. Consider reinstating preference for treatment of contaminated soil.

b. Groundwater Remediation

Comprehensive Response Actions to address groundwater contamination may involve systems which pump the groundwater to an above-ground treatment system or *in-situ* treatments, such as sparging or bioremediation. Groundwater remediation is typically a long-term process which may be conducted under Remedy Operation Status or a Class C RAO.

The consensus among DEP staff and the LSP community appears to be that much less comprehensive groundwater treatment is occurring under the new regulations.

LSPs acknowledge that under the 1993 MCP there is more delay in addressing groundwater contamination as PRPs explore risk assessment solutions.[39] They note that there was probably more groundwater treatment in the old program, but the treatment was often unnecessary from a risk perspective.

Table 4-5

To what extent do you believe remedial systems (e.g., pump and treat) are being turned off prematurely or not maintained?				
	Often	Sometimes	Rarely	Unsure
LSPs	8 %	46 %	32 %	14 %
DEP Staff	44 %	40 %	4 %	12 %

DEP continues to receive complaints about the need to cleanup to drinking water standards where there is no apparent threat to a well (including in local aquifer protection districts). Even some DEP staff have argued in Focus Groups that DEP should establish alternative criteria for shutting-off groundwater treatment systems, because, "*PRPs currently try to argue their way out of GW-1 areas and want DEP to reduce the scope of these areas. PRPs want to model their way out of Zone II's. If the technology cannot meet GW-1 standards, maybe there should be a way to allow PRPs to do as much as they can and get a permanent solution provided they can demonstrate there will be no impact to the public well*." On the other hand, most DEP staff surveyed believed that remedial systems, including groundwater treatment systems, are sometimes (or frequently) turned off prematurely and/or not properly maintained (Table 4-5), as did more than half of the LSPs surveyed. The implication is that drinking water standards are not being met in areas that are supposedly protected for use as a water supply.

Table 4-6

Most Commonly Found VOCs in Community Water Supplies
1,1,1-Trichloroethane
Trichloroethylene
Tetrachloroethylene
Dichloromethane
Toluene
Cis-1,2-Dichloroethylene
1,1-Dichloroethane
1,1-Dichloroethylene
Methyl Tertiary Butyl Ether
Benzene

In fact, DEP Water Supply staff have noted a trend in VOC detections in public water supplies. Detection rates for these ubiquitously used compounds at community groundwater sources have risen from 12% to 32% in the six years from 1991 to 1996[40], although there have been no violations of drinking water standards. The chemicals reported are frequently associated with contamination found at c. 21E regulated sites.

[39] This exercise is commonly called "*risking away the problem*".

[40] This preliminary data has not been controlled for improvements in VOC detection limits or for yearly variation in the number of wells tested.

There are also private-sector concerns about the MCP requirement that groundwater data from individual monitoring wells be evaluated for compliance with drinking water standards in GW-1 areas. DEP staff have noted that, in general, groundwater plumes are not well characterized due to cost limitations, and the strict application of drinking water standards in protected areas is an appropriate means of controlling this uncertainty. Further, LSP modeling of groundwater data to demonstrate "no impact" to a downgradient water supply well is itself uncertain and does not consider the presence of additional sources which may affect the well.

Conclusions/Options: The apparent drop-off in the number of groundwater treatment systems operating at sites and the disturbing data identified by the DEP Water Supply Program raise the question of whether the MCP is adequately protecting current and future drinking water resources. Rather than lessen the remedial requirements in GW-1 areas, as suggested by some LSPs and DEP staff, DEP should comprehensively evaluate the VOC-contaminated community water supply systems identified by the Water Supply Program to determine if there is a positive correlation between the apparent increase in contamination and the existence of 21E sites in the affected watershed. The results of such an analysis could be used to assess the adequacy of the current 21E program in terms of water resource protection.

C. Adequacy of Site Risk Characterizations

This section examines the technical adequacy of the DEP Risk Characterization procedures which ultimately determine the cleanup requirements for a site. DEP has focused on several major issues that have been raised during the program evaluation but acknowledges that other less significant items also should be and will be addressed during future revisions of the regulations.

The risk characterization conducted to determine the need for remedial actions is based upon information collected during the site investigation. It is not uncommon for DEP to find during an audit that the risk characterization is technically correct, but that the assessment relies upon inadequate site information, rendering the results invalid. While defining the nature and extent of a release is a basic requirement of the MCP,[41] both DEP staff and LSPs have indicated that cost pressures have resulted in inadequate site assessments. (Despite the fact that nearly half the LSPs responding to a survey believed that the cost of assessment and cleanup are better under the new MCP.)

DEP staff have noted that smaller PRPs may focus their efforts on cleanup, but they are not willing to spend a lot on assessment. Staff are finding that they spend a lot of time on technical disputes over the extent of contamination (e.g., is the site clean or did the plume move away?). They believe that there is not enough assessment being done and that PRPs are trying to spend as little as possible to meet the minimum requirements. One common failing is that LSPs are only

[41] for example see 310 CMR 40.0835(4) and 40.0904(2).

looking within property boundaries; they might check to see if private supplies are nearby, but they do not sample them. They are not looking at wetlands or surface waters unless specifically directed.

One LSP explained that, at least for utility companies, "*there are carefully designed programs to close MCP sites while leaving many 'nature & extent of contamination' questions unanswered. The strategy is: let the DEP come audit us, if they find something we'll fix it, we don't really care if we or our LSP gets a NON. However based upon the odds we don't think the DEP will audit our 50-100 sites so we will be winners in the end by closing these as fast as possible.*"

Another LSP noted that there is an unending stream of sites where USTs are removed and the tank contractor and fire chief say it is OK, but no samples have been taken. It is very hard with this situation to convince owners to sample the locations of former underground tanks.

1. Data Quality

One important aspect of the site investigation involves the quality of the data used to make remedial decisions. During recent discussions between DEP staff and the LSP community involving the development of the new VPH/EPH analytical method, it became clear that many LSPs and DEP staff rely upon laboratory data without a detailed evaluation of the quality of the data. Many DEP site managers and LSPs rely upon the certification of a laboratory as an indicator of the quality of work conducted at the facility. Unfortunately DEP only certifies laboratories for water analyses under the Safe Drinking Water Act. This is reflected in the somewhat higher level of confidence LSPs have in groundwater analyses.

Table 4-7

How Confident Are You About The Data You Receive From Laboratories?

	Confident	Somewhat Confident	Not Confident
Soil Analyses			
LSPs	56 %	38 %	5 %
DEP Staff	33 %	43 %	19 %
Groundwater Analyses			
LSPs	75 %	23 %	1 %
DEP Staff	35 %	48 %	12 %
VPH/EPH			
LSPs	25 %	45 %	28 %
DEP Staff	15 %	53 %	26 %

While 56% of LSPs are confident in the quality of the soil analyses they receive, DEP staff believe this confidence may be misplaced: 62% are, at most, "somewhat confident" about the soil data. The majority of survey respondents felt that DEP should expand the laboratory certification program to include soil analyses (table 4-8).

Table 4-8

Do you believe DEP should certify laboratories for soil analysis for 21E sites?

	Yes	No	Unsure
LSPs	72 %	23 %	5 %
Consultants	71 %	25%	4 %
DEP Staff	79 %	19 %	2 %

Options:

1. Continue education of DEP staff and LSP community on laboratory analyses, including QA/QC procedures, uncertainties, limitations and the proper use of data.
2. Amend MCP analytical data section to require certain minimum data and QA/QC reporting requirements.
3. Consider certifying labs for soil
4. Target some audits to include soup to nuts review of lab data.
5. Consider evaluating laboratory quality through the use of double-blind samples.

2. Hot Spots

The identification of Hot Spots, or locations with higher levels of contamination than the surrounding area, is used to focus remedial efforts in areas that would result in the highest reduction of risk. Since Exposure Point Concentrations in Hot Spots cannot be averaged into the lower concentrations in the surrounding area (mathematical dilution), the definition of Hot Spots could determine the extent of remedial actions needed for a site. As noted by one LSP, *"There is a lot of hot spot removal to get down below the Method 1 standards."* DEP has noted that at many sites remediation is also driven by the need to eliminate hot spots in which concentrations exceed UCLs.

The 1993 MCP left the definition of a "Hot Spot" to the professional judgment of the LSP, but in 1995, a definition was proposed and promulgated in response to comments from the LSP community that a regulatory definition was needed. The MCP now defines a Hot Spot, considering both concentration (10-100 fold difference) and exposure potential.

Some Focus Group comments indicate that the current definition and guidance are "*complicated and hard to apply*" and "*not helpful*." It was noted that it is difficult to determine the boundary of a Hot Spot when there is "*limited or widespread data*." Several commenters indicated that "*The definition and guidance do not provide recommendations for sampling density or limits on areal and spatial extent of hot spots*." Finally, comments have come full circle: "*[LSPs] need more freedom to deal with [Hot Spot] Exposure Point Concentrations...DEP is forcing the risk assessor to address the hot spot in a particular way.*"

Conclusions/Options: While DEP is open to suggestions concerning an appropriate regulatory definition of a Hot Spot that will satisfy the competing desires for certainty and flexibility, it appears that the described problem is more relevant to the larger question of what constitutes an adequate site investigation. DEP should develop guidance with recommended sampling density or methods to address hot spots if data is limited. It may be appropriate to consider visibly stained soil as potential Hot Spots regardless of extent or relative concentrations, simply to encourage sampling in such areas.

3. Exposure Points/Exposure Point Concentrations

The calculation of Exposure Point Concentrations (EPCs) are a necessary and critical element in the characterization of risk at a disposal site, and determination of compliance with Method 1 standards. Conceptually, this is a relatively straight-forward exercise, and adequate "big picture" guidance already exists in DEP's *Guidance for Disposal Site Risk Characterization* (1995). However, the application of this concept and guidance on "real world" sites has proven to be inconsistent and problematic, and numerous anecdotal accounts have been offered to and observed by DEP staff on misapplications (and outright abuses) in this area.

Conclusions/Options: Additional specificity can be offered, either in the MCP or guidance documents. This specificity can be in the form of default recommendations, rebuttable presumptions, and/or "rules of thumb" on sampling density and techniques. Common site scenarios, such as Underground Storage Tank excavation areas, can receive increased attention and focus, as can common and difficult soil averaging issues involving three-dimensional data evaluations. DEP should work with the LSP community to identify the appropriate level of detail for such guidance.

4. Soil and Groundwater Categories

Table 4-9

Do you believe the different cleanup standards for soil and groundwater depending upon site uses and likely exposures are <u>clear</u>?			
	Agree	Somewhat Agree	Disagree
LSPs	63 %	27 %	8 %
DEP Staff	54 %	39 %	5 %

The MCP provides criteria to categorize site soil and groundwater based upon both the current and potential future use of the site and the surrounding community.[42] Because the soil standards consider the possibility of contaminants leaching to the groundwater, there are, in fact, 12 different soil and groundwater category combinations which could apply at a site. In 1993 DEP and the regulated community were concerned that the categorization process and the application of the standards would be overly complex, but that the complexity would be balanced by the flexibility of choosing cleanup goals tailored to site use. As indicated in Table 4-9, most users of the MCP find believe the process to be clear, and there have been no significant proposals to change the categorization process.

a. GW-1

The 1993 MCP defined the GW-1 groundwater category to include all groundwater currently used as drinking water and groundwater which may be used as a future drinking water resource. The intent was to clearly identify those groundwaters that required a high level of protection. Previously all groundwater in Massachusetts was considered a

[42] See 310 CMR 40.0930.

potential future water resources, no matter how unrealistic the prospect. As a result, there was no effective means to prioritize groundwater cleanups or to allocate state resources. DEP has worked with the regulated community and other state agencies to further refine the criteria for this category, particularly to identify future drinking water resource areas, culminating in the promulgation of regulations in September 1996 defining "*Potential Drinking Water Source Areas*" and "*Non- Potential Drinking Water Source Areas.*"

Three relatively minor issues remain concerning the criteria for GW-1 groundwater. One concerns the need for a Grant of Environmental Restriction when abandoning a private water supply in order to change the groundwater category. This issue is discussed in more detail in section 4.D.1.e.

The remaining issues involve the Zone A of a Class A Surface Water Body. First, due to recent revisions to the drinking water regulations,[43] the definition of a Zone A contained in

Table 4-10

Comparison of Zone A Definitions

MCP 310 CMR 40.0000	Drinking Water Regulations 310 CMR 22
Zone A means the area within 400 feet laterally from the bank of a Class A surface drinking water source (as identified in 314 CMR 4.00) and its tributaries.	Zone A means (a) the land area between the surface water source and the upper boundary of the bank; (b) the land area within a 400 foot lateral distance from the upper boundary of the bank of a Class A surface water source, as defined in 314 CMR 4.05(3)(a); and (c) the land area within a 200 foot lateral distance from the upper boundary of the bank of a tributary or associated surface water body.

the MCP is slightly inconsistent with that of the drinking water program (Table 4-10). Second, for Interim Wellhead Protection Areas (IWPAs) and private drinking water supplies, the MCP allows for a demonstration that a site is not hydrogeologically connected to the well in question, thereby exempting the site from the GW-1 category. A similar argument could be made for Class A Surface Water Bodies, as long as the exemption includes ***both*** a hydrogeologic argument and a topographic demonstration that the site is not in the watershed.

b. GW-2

Currently, the application of the GW-2 groundwater category is limited to sites where the depth to groundwater is relatively shallow (less than or equal to 15 feet below ground surface), and where an "occupied building or structure" is present. The purpose of this

[43] 310 CMR 22.00, March 1997.

categorization is to ensure that exposures to volatile contaminants potentially off-gassing from the groundwater are adequately considered. Currently the regulations only consider ***existing*** occupied buildings or structures or planned future construction when categorizing the groundwater, primarily because the implementation of AULs at any potentially affected downgradient property was considered to be an onerous requirement. At issue is whether it is necessary or prudent to extend this category to all sites with relatively shallow groundwater, to be protective of buildings that may be constructed at the site.

Some LSPs and risk assessors are uncomfortable with the fact that the MCP permits them to RAO a site (without an AUL) with the potential of a future building having an indoor air problem. One consultant considered it "*sqirrelly*" [crazy] that DEP isn't concerned about future buildings and indoor air, and another noted that "*even the lawyers question this.*" (See the discussion on AULs and Future Buildings, Section 4.D.1.d.)

Options:

- Keep the current definition, on the assumption that elevated concentrations of volatile contaminants in shallow groundwater are likely a short-term concern at most sites, if appropriate source control was undertaken, as required by 310 CMR 40.1003(5);
- Keep the current definition, but allow and/or require the use of Activity and Use Limitations (AULs) as an institutional control to inform the design of or prohibit future construction of buildings (considering the legal implications about limiting property use);
- Extend the category to include all shallow groundwater, to ensure adequate consideration of this pathway at all sites; or
- Extend the category to include all shallow groundwater, but allow exemptions (perhaps via Method 3) to exclude sites where future impacts are unlikely, due to subsurface conditions, source control measures, and/or the presence of readily degradable contaminants (e.g., petroleum products).

5. Background Definition

The term "background" is not defined in the statute, but the concept is indirectly referenced as part of the definition of a "*Permanent Solution.*"[44] The statutory term *"the level* [of a contaminant] *which would exist in the absence of the site of concern*" has been interpreted by DEP to be "background" in both the 1988 and the current MCPs. This statutory concept of reducing contaminant concentrations as close to background as possible whenever remedial actions are implemented at a site has been explicitly

[44] M.G.L. Chapter 21E, §3A(g): "Where feasible, a permanent solution shall include a measure or measures designed to reduce to the extent possible the level of oil or hazardous materials in the environment to the level which would exist in the absence of the site of concern."

incorporated in the basic performance standard of the MCP, the *Response Action Performance Standard* (or RAPS).[45] This is one mechanism provided for in the statute for addressing the unquantifiable risks posed by residual contamination at a site.

The MCP definition makes clear that the term is not limited to pristine conditions, and that DEP recognizes that historic human activities have resulted in the presence of some chemicals in the environment.

MCP Background Definition
(310 CMR 40.0006)

Background means those levels of oil and hazardous material that would exist in the absence of the disposal site of concern which are:

(a) ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern; and

(b) attributable to geologic or ecologic conditions, atmospheric deposition of industrial process or engine emissions, fill materials containing wood or coal ash, releases to groundwater from a public water supply system and/or petroleum residues that are incidental to the normal operation of motor vehicles.

DEP has received many comments concerning its interpretation of the statutory language. In particular, some people believe that the "*limited acknowledgment*" of anthropogenic contamination in the MCP definition does not go far enough to reflect the [apparent] statutory concern with distinguishing between the disposal site and any other hazardous materials present in the environment, whether naturally occurring or anthropogenic.

DEP believes that such a broad interpretation of the statutory language would allow the contamination present from one release (one type of "anthropogenic source") to be considered "background" for a neighboring site. Thus, locations with multiple historic sites would be considered an area of high "background" levels, which would limit the need for remediation. In fact, because "background" is considered to be a level of No Significant Risk, [46] no remediation would be required in such neighborhoods.

Conclusions/Options: DEP believes that the current definition of background in the MCP is consistent with the language and the intent of the statute. A broader interpretation, as suggested by commenters, would result in pockets of contaminated sites, each justifying high levels of contamination based upon its proximity to another site. Such a change would necessitate the elimination of the MCP clause equating background with No Significant Risk to insure the protection of public health. DEP acknowledges that there may be a need to modify the MCP definition of background, and DEP would welcome specific suggestions to address common anthropogenic sources which would meet the statutory and lay meaning of "background."

6. Imminent Hazards

[45] 310 CMR 40.0191(1) and 40.0191(3)(c). See also the RAO requirements of 310 CMR 40.1020.

[46] 310 CMR 40.0902(3)

Imminent Hazards are site conditions which would be of regulatory concern if they were to persist without cleanup for even a short period of time. An Imminent Hazard may exist for human health or environmental concerns. The regulatory definition of an Imminent Hazard is broader than the lay understanding of the term, which invokes images of denuded landscapes and crippling health effects. The definition under the MCP[47] is tied to the term "significant risk", which is determined by the risk characterization Methods described in Subpart I. Imminent Hazards require 2-hour notification to DEP and expedited investigation and cleanup. Several concerns about the way Imminent Hazards are addressed in regulation and guidance have been expressed. These include issues related to specific chemicals (particularly arsenic) as well as the overall approach.

Several commenters expressed concern that the concentration of arsenic in soil which could pose an imminent hazard[48] was just slightly greater than the Method 1 cleanup standard, and that this level was often exceeded at sites in central Massachusetts where there are high, naturally occurring levels of arsenic in soil. It has been suggested that region-specific Reportable Concentrations could be promulgated to eliminate "needless" reporting of high background arsenic sites, or that a blanket exemption from notification for background conditions should be added to 310 CMR 40.0317.

More generally, concern has been expressed over the difficulty of applying the risk assessment approaches described in the MCP to Imminent Hazard conditions. Other than those contaminants and concentrations clearly identified as being of concern for an imminent hazard, any other site where the contamination is of potential concern requires referring to multiple sections of the MCP and guidance which "*are either vague or nonexistent.*" In Focus Groups, risk assessors have noted that "*the regulated community doesn't necessarily understand that if you are conducting a normal Phase II risk assessment and see high risks (>10^{-4}) under current conditions then it is an Imminent Hazard - we may be missing some Imminent Hazards.*" DEP staff concur and state that "*is unlikely most new releases are evaluated...in this manner. The MCP as written makes it quite arduous to follow the various regulatory steps someone should take to determine if an imminent hazard exists, particularly early in the process.*"

Conclusions/Options:

While DEP is sensitive to the concerns about arsenic background levels, the potential health risks associated with arsenic in soil, even when it is naturally occurring, justifies the need to notify and adequately characterize the site before it is dropped from the system. Additional guidance may be warranted, however.

[47] 310 CMR 40.0006 and M.G.L. c.21E: Imminent Hazard means a hazard which would pose a significant risk of harm to health, safety, public welfare or the environment if it were present for even a short period of time, as further described in 310 CMR 40.0950.

[48] 310 CMR 40.0321(2)(b) lists concentrations of seven chemicals which, under certain circumstances, could pose an Imminent Hazard. The concentration listed for arsenic is 40 µg/g.

Changes to the Imminent Hazard requirements to be considered include simplification of the Imminent Hazard Evaluation procedures, addition of common chemicals to the list of potential imminent hazard conditions at 310 CMR 40.0321, and education and training for LSPs and DEP staff. Failure to notify concerns may also be addressed by initiating audits earlier in the MCP process, pursuing enforcement action against LSPs, as well as PRPs, and referring LSPs to the LSP Board.

7. Substantial Hazards

Substantial Hazards are site conditions which would be of regulatory concern if they were to persist without cleanup for even several years. A Substantial Hazard may exist for human health or environmental concerns. Substantial Hazard is defined in M.G.L. Chapter 21E.[49] The elimination of Substantial Hazards is a requirement for a Temporary Solution (Class C RAO).

While DEP has published some guidance on the evaluation of Substantial Hazards, LSP and DEP comments on this issue may be summarized by the following quotation from DEP staff: "*Better guidance is needed on a number of issues. Staff have spent hours internally debating what a substantial hazard is, and did not reach any consensus. If staff don't know, how are LSPs going to know?*"

Conclusions/Options: The MCP should interpret the statutory definition of "No Substantial Hazard".

[49] 310 CMR 40.0006 and M.G.L. c.21E §2: Substantial hazard means a hazard which would pose a significant risk of harm to health, safety, public welfare or the environment if it continued to be present for several years.

8. Method 1

Risk Characterization Method 1 is a simple approach which makes use of generic soil and groundwater standards. A Method 1 Risk Characterization results in certain and predictable cleanup requirements. Method 1 is the most commonly used approach.

a. Comparison to Other States' Standards

In 1993 Massachusetts became one of the first states to promulgate generic cleanup standards to be used in a waste site cleanup program. Numerous states and the US EPA have published standards or guidelines which have the same general goals of the MCP Method 1 standards. One measure of the appropriateness of the Massachusetts standards is to compare the Method 1 standards to analogous standards developed by other regulatory agencies. In order to ensure comparability, we have selected three types of standards for comparison: residential soil standards (MCP S-1 Direct Contact Standards listed at 310 CMR 40.0985(6)), drinking water standards (MCP GW-1 standards, listed at 310 CMR 40.0974(2)), and leaching-based soil standards intended to protect drinking water (MCP leaching-based values, listed in the 1994 document *Background Documentation of the Development of the MCP Numerical Standards*.)

The comparison was limited to 10 typical chemicals commonly found at sites: benzene (Benz), toluene (Tol), methylene chloride (MC), Vinyl chloride (VC), PCBs, tetrachloroethylene (PCE), benzo[a]pyrene (B[a]P), naphthalene (Naph), arsenic (As) and mercury (Hg). Figures 4-8, -9 and -10 graphically depict the results of these comparisons.

i. Residential Soil Standards

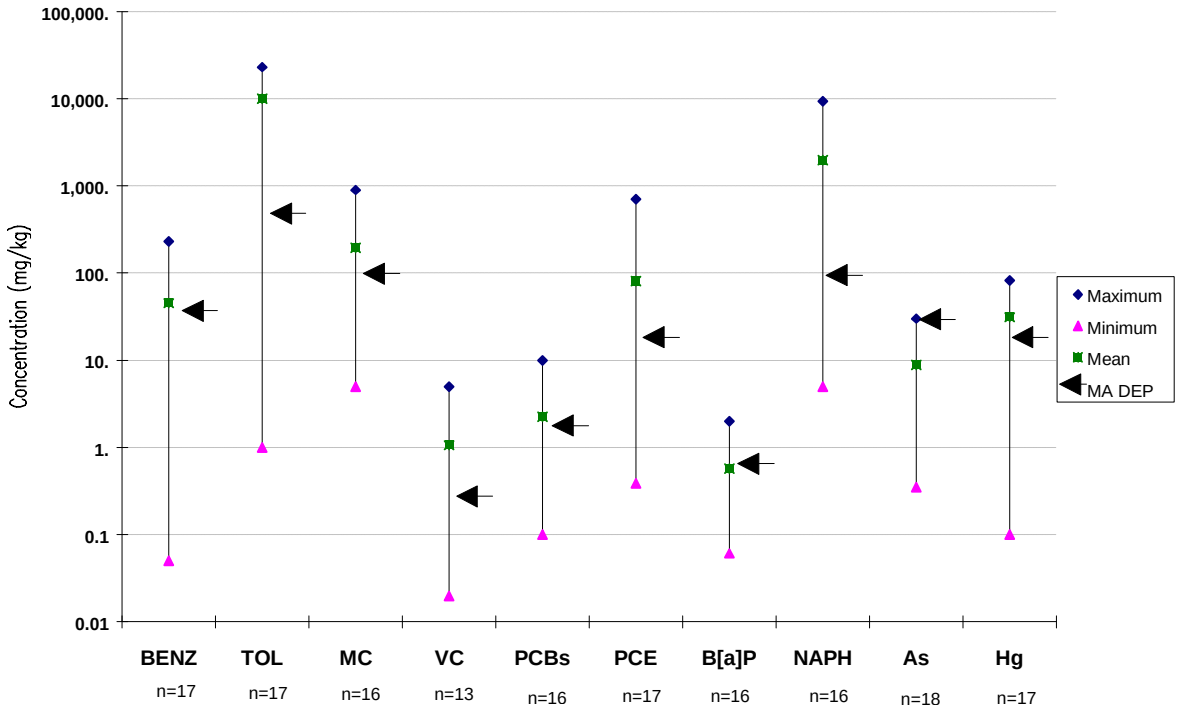
Figure 4-8 compares the MCP Method 2 S-1 Direct Contact Standards[50] to similar concentrations developed by 17 other state, province and federal agencies.[51] While the specific methodologies and assumptions may vary from state-to-state, the goal of each program is to identify concentrations of the chemicals in soil which would be acceptable in a residential setting.

[50] The MCP Method 1 S-1 Standards were not used here as they include the soil-leaching pathway.

[51] AK, AZ, CT, ME, MI, MO, NJ, NY, OR, PA, TX, WA, WI, WY, EPA, British Columbia and Ontario.

Figure 4-8

Comparison of Direct Contact-Based Soil Standards



The Massachusetts standards are generally in the middle of the range of the different states' standards. The MCP sets the highest standard for one chemical, arsenic, and standards towards the low end of the range for two chemicals (toluene and naphthalene). These extreme values actually demonstrate the moderation of the DEP standard setting process which sets upper- and lower-bounds on the quantitative risk calculations by incorporating qualitative risk and non-risk considerations. For toluene and naphthalene, other state standards are *extremely* high (up to 23,000 mg/kg, or 2.3% toluene in soil), while the Massachusetts values are capped by the ceiling concentrations to protect against unevaluated risks and aesthetic concerns. On the other hand, other states have published low values for arsenic, while the Massachusetts values are set at the "floor" criteria of background.

ii. Comparison of Drinking Water Standards

Figure 4-9 compares the MCP Method 1 GW-1 Standards with the drinking water standards and guidelines of 46 other state, province and federal agencies.[52] While the specific methodologies and assumptions may vary slightly from state-to-state, the goal of each program is to identify concentrations of the chemicals in water

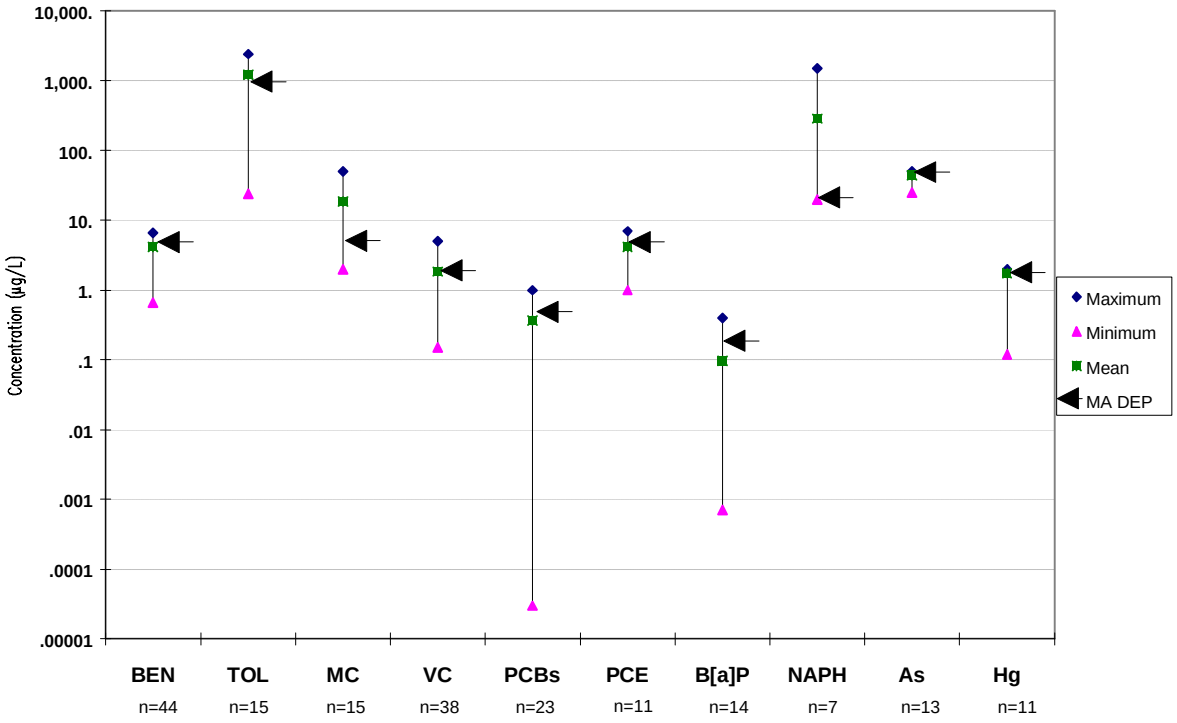
[52] AK, AL, AZ, CA, CO, CT, DE, FL, GA, IA, ID, IL, IN, KS, KY, LA, MD, ME, MI, MN, MO, MT, NE, NH, NJ, NC, ND, NM, NY, OH, OK, OR, RI, SC, SD. TN, TX, UT, VA, VT, WA, WI, WV, EPA, British Columbia and Ontario.

which would be acceptable for drinking water use. There is marked similarity across the states as most programs, including the Massachusetts waste site cleanup program, follow the US EPA lead in publishing drinking water standards.

The MCP GW-1 standards are similar in value to other state standards. In two cases, PCBs and benzo[a]pyrene, the Massachusetts standards are on the high end of a wide range of values, and in two cases, methylene chloride and naphthalene,

Figure 4-9

Comparison of Drinking Water Standards



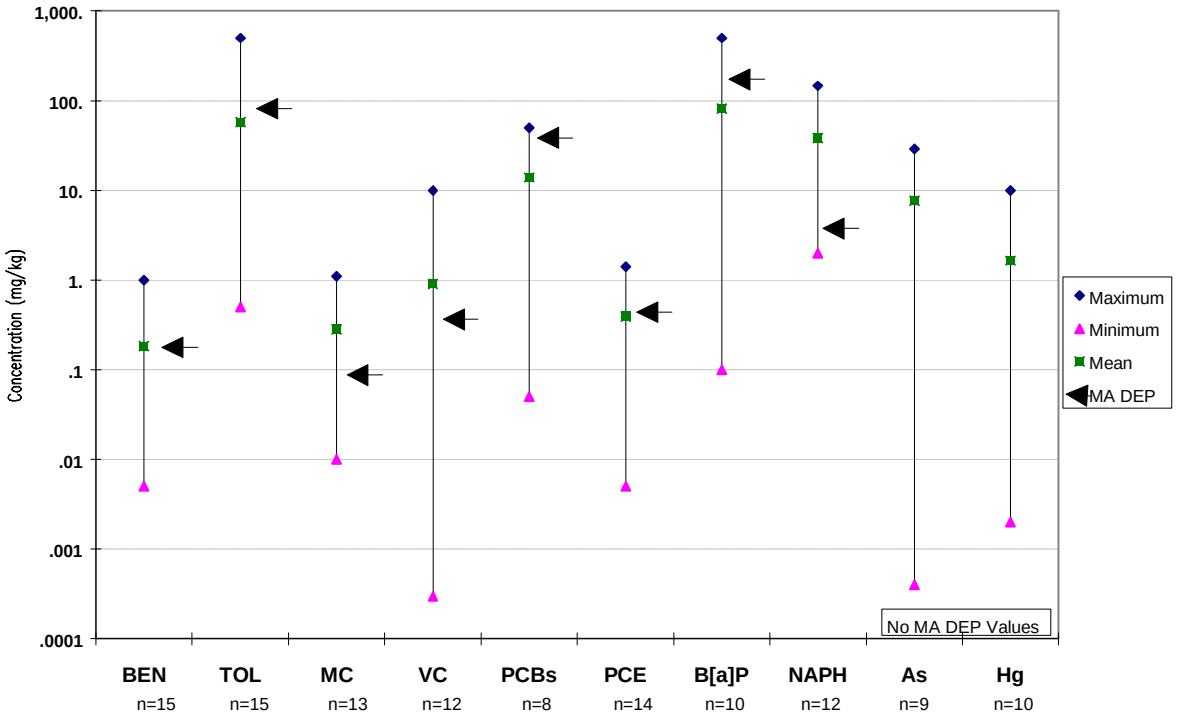
the Massachusetts standard is towards the low end of the range. With the exception of the naphthalene value, the GW-1 standards were not developed specifically for the MCP: they were adopted directly from the Massachusetts Drinking Water Standards (310 CMR 22).

iii. Comparison of Leaching-Based Soil Standards

The MCP Method 1 Soil Standards consider both direct contact risks and the threat that the soil may pose to the underlying groundwater. Figure 4-10 compares the leaching-based component of the MCP standards to leaching-based standards from 14 other state, province and federal agencies.[53] Again, the MCP standards are similar in value to those of the other states. The relative position of the DEP values to those of the other states appears to be most influenced by the target groundwater level: where the GW-1 standard is relatively low (e.g., naphthalene) the leaching-based standard is relatively low. Compared to the other states, the leaching model used by DEP to develop the Method 1 standards does not appear to be biased high or low. This observation stands in contrast to the results of the DEP evaluation of the leaching model used to develop these standards (see the discussion in section 4.C.8.b.). It is also important to note that, unlike several of the other states, the Massachusetts standards did not model the leaching of metals to groundwater.

Figure 4-10

Comparison of Leaching-Based Soil Standards



[53] AK, CT, IL, ME, MI, NJ, NY, OR, PA, TX, WA, WI, EPA and Ontario

b. Soil Standards

The MCP Method 1 standards for soil are calculated considering cancer and noncancer risks from direct contact with the soil and the potential for the contaminants to leach from the soil and contaminate the underlying groundwater. This section discusses the development of the standards and issues that have been raised concerning these values.

i. Leaching to Groundwater

All Method 1 soil standards are designed to be protective of leaching concerns. As it turns out, leaching is the controlling pathway for a large number of contaminants, especially in GW-1 areas.

Table 4-11

Soil Category	% Standards Controlled By Leaching Pathway
S-1/GW-1	56
S-1/GW-2	20
S-1/GW-3	21
S-2/GW-1	57
S-2/GW-2	23
S-2/GW-3	27
S-3/GW-1	57
S-3/GW-2	25
S-3/GW-3	31

To evaluate this pathway in 1993, DEP chose to use two models, SESOIL and AT123D, to develop an algorithm to relate key physical properties (Henry's Law Constant and soil/water partition coefficient) to a soil/groundwater Dilution and Attenuation Factor (DAF) for each Method 1 standard. This was the approach that had been developed by the State of Oregon in 1992.

Based upon an evaluation of the models and inputs by the DEP Northeast Regional Office, several significant problems have been identified:

- The "dispersivity" factors (which model the "spreading" of contaminants in the plume) employed are 10 to 100 times too high. Soil standards may be significantly lower than the current values.
- The Disconnectedness Index (which models the movement of water/leachate through the vadose zone) is overly conservative. Soil standards corrected for this factor alone would be somewhat higher than current values.
- The Henry's Law Constant used for one of the 8 "benchmark" compounds (used to develop the leaching algorithm) appears to be inappropriately low. This would significantly change the DAF algorithm, and change the current $r^2 = 0.99$ to an $r^2 = 0.91$ value.

Collectively, if all of the errors are corrected, and no other input assumptions or conditions are changed, corrected Method 1 soil concentrations of some compounds would have to be lowered by up to a factor of 50. As noted above, this would effect a substantial percentage of the Method 1 standards.

In addition to the details about the adequacy of the model parameters, DEP is evaluating the "big picture" question of how well the Method 1 soil standards protect groundwater. Two important points should be kept in mind:

- Consistent with past DEP practice, the derivation of Method 1 standards incorporated a number of conservative assumptions; and
- Leaching-protective soil standards are an indirect "first level" screen of potential groundwater concerns; direct measurement of groundwater quality is a preferred, and routinely accomplished, site assessment activity. Thus, soil standards that are not leaching-protective are really only a problem at those minority of sites where groundwater quality is not directly ascertained.

The primary areas of conservatism used in the models to derive leaching-protective include:

1. Biodegradation was not considered, except for benzene.
2. Single-compound (maximum) solubility values were used for all compounds.
3. Leaching-protective Method 1 soil standards were based upon maximum predicted groundwater impacts rather than multi-year or lifetime averaging periods
4. Desorption was assumed to be linear and instantaneous.

On the other hand, elements of conservatism factored into specific Method 1 soil standards are potentially offset by the inadequate soil data obtained at many sites[54], and the concern that higher concentrations may exist in unsampled areas. Moreover, it is now clear that most of the soil data obtained for the most leachable soil contaminants (VOCs) underestimates actual soil concentrations by 1 to 3 orders of magnitude[55].

Conclusions/Options:

a) Recalculate a correct DAF algorithm, using the recommendations provided in this paper. Run additional "benchmark" chemicals, to increase statistical confidence. Select benchmark chemicals from among the most commonly released contaminants. Use the actual DAF values from the modeled runs for all benchmark chemicals, and the DAF algorithm for remaining compounds.

b) Consider incorporating biodegradation constants for petroleum contaminants. Consider use of an averaging period, not maximum concentrations, in establishing acceptable receptor groundwater levels.

[54] A review of DEP Notices of Audit Findings (NOAFs) found numerous problems in the accuracy and precision of site data as well as inadequate site characterization.
[55] SEE the discussion of methanol preservation in the May 1996 VPH/EPH Issues Paper

c) Include metals in re-examination of leaching pathway. (SESOIL/AT123D can now accommodate metals)

d) Consider inclusion of a soil-to-indoor air pathway in recalculation of soil standards, using ASTM RBCA equations.

ii. Soil Standards Based on Direct Contact

S-3 Standards

The Method 1 S-3 standards use a soil ingestion rate of only 50 mg/day for an adult digging in soil. Consistent with US EPA recommendations, DEP guidance[56] suggests using a soil ingestion rate of 500 mg/day when evaluating high intensity exposures, such as excavation. One commenter questioned whether the S-3 standards are sufficiently protective of a construction worker. Other commenters believe that the DEP exposure assumptions are very conservative (health-protective).

Conclusions/Options: DEP will evaluate specific exposure assumptions associated with the Method 1 soil standards, including the appropriate soil ingestion rates, to evaluate overall protectiveness of these values.

Standards Based Upon MADEP Sludge Regulations

When the MCP Method 1 standards were developed, a number of the calculated values were lower than the existing standards for the unrestricted land application of septage sludge. In an effort to be consistent with other DEP regulatory programs, some MCP soil standards for PCBs and Lead[57] were set equal to the higher land application of sludge values. Some commenters have noted that, because they have been set higher than the calculated "risk-based" values, these standards are not sufficiently protective. Further, it has been suggested that the land application of sludge regulations be revised to reevaluate the PCB and Lead standards in light of the health-based MCP criteria.

Table 4-12

Comparison of Calculated MCP Soil Values to Land Application of Septage Sludge Standards

Chemical	Calculated S-1 Value (mg/kg)	Land Application of Sludge Standard (mg/kg)
Lead	90	300

[56] Guidance for Disposal Site Risk Characterization, BWSC/ORS-95-141

[57] The standards for Zinc was also adjusted, but the S-1 standard of 1,000 mg/kg is based upon the ceiling value and is not risk-based. The risk-based value (16,000 mg/kg) is actually higher than the land application of sludge value of 2,500 mg/kg.

Conclusions/Options: While the PCB and Lead standards are higher than the "risk-based" numbers, this is also true for MCP standards set considering quantitation limits and background. For both chemicals the promulgated standard is higher than it would otherwise be under the MCP, but falls below the "significant risk" criteria for cumulative risk.[58] As the land application of sludge regulations are reevaluated (scheduled for the coming Fiscal Year), DEP will revisit the standards for these chemicals to maintain regulatory consistency and to protect public health.

Individual Chemicals

Concerns have been raised about several standards for individual chemicals, including arsenic (due to high background levels in some parts of Massachusetts) and benzo[a]pyrene. While the comments received by DEP indicate that the current standards are too low, both values are set higher than their "risk-based" levels due to background or quantitation considerations. Also, as noted in Figure 4-8, the MCP standards for these chemicals are consistent with (or higher than) similar standards in other states.

Conclusions/Options: DEP will continue to evaluate chemical-specific comments within the framework of the MCP standard setting process. DEP welcomes any additional data which would justify changes (raising or lowering) to any of the current MCP standards.

iii. Soil-to-Air Pathway

When developing the methodology to derive the MCP numerical standards DEP considered incorporating a soil-to-air migration model into the soil standards. The regulated community commented that the soil-to-air pathway was of concern at a limited number of sites and that incorporating that pathway into all the soil standards would needlessly lower the applicable standards. It was suggested that by limiting the use of the Method 1 standards to sites without indoor air impacts, sites with a soil-to-air pathway would be evaluated in a Method 3 assessment.

Anecdotal evidence from the Focus Groups and data on the use of the various risk characterization Methods suggest that potential indoor air exposures are not being addressed[59], particularly from the soil-to-air pathway. While the risk characterizations do not note or evaluate this pathway, Activity and Use Limitations are routinely applied to properties at which there is residual soil

[58] 310 CMR 40.0902(2)

[59] It has been suggested that LSPs may disregard potential indoor air exposures to avoid a Method 3 Risk Characterization and to minimize the Numerical Ranking System (NRS) score for a site. The NRS scores 200 points for a confirmed indoor air exposure.

contamination directly under a building. It is likely that significant exposures are not being evaluated at sites.

Conclusions/Options: DEP should consider either incorporating the soil-to-air pathway into all the Method 1 soil standards, creating an additional category addressing just contaminated soil near occupied structures (the soil equivalent of the GW-2 category) or developing Method 1 indoor air standards.

c. Groundwater Standards

This section examines the development of the MCP Method 1 Groundwater Standards and discusses issues raised concerning the adequacy of the methodology.

i. GW-1 Groundwater

The GW-1 standards are either adopted from existing Massachusetts Drinking Water Standards (310 CMR 22), Massachusetts Drinking Water Guidelines, or developed for the MCP using standard EPA equations and assumptions. It is DEP's intention that the GW-1 standards be consistent with existing state and federal standards.

Since 1993 DEP has received a small number of comments concerning the GW-1 standard for specific chemicals, but there have been no issues raised concerning the overall process.

ii. GW-2 Groundwater

[See also Section 4.D.2 - Activity and Use Limitations]

The GW-2 standards are designed to be protective of adverse indoor air impacts from VOCs off-gassing from contaminated groundwater. This entire phenomenon is complex and highly variable, and poorly understood and modeled, even today. Our calculations involved the use of the Johnson and Ettinger Heuristic Model, which remains to this day the most commonly accepted, though controversial, approach.

In order to determine the appropriateness of certain assumptions incorporated into the model, DEP Northeast Regional staff evaluated 47 sites (and subsites) which were deemed to have data of sufficient quality and validity. (21 sites were contaminated with petroleum (BTEX) products, and 26 sites with chlorinated solvent contamination, with about half these sites residential, and half commercial/retail/schools.) . The findings include:

- The partitioning assumption of 10% of the Henry's Law condition appears overly conservative in most cases

- The indoor air/vadose zone attenuation factor of 5 x 10^{-4} appears to be insufficiently protective in most cases.
- Significant differences were observed between fate of the petroleum and chlorinated compounds.

Interestingly, the above findings are almost "a wash": the 10% partitioning assumption was overly conservative by about an order of magnitude, while the attenuation factor was unconservative by about an order of magnitude. However, depending upon the contaminant of concern (i.e., chlorinated vs. petroleum VOCs), and specific site conditions (i.e., foundation design), it is clear that GW-2 standards will not be protective at a significant percentage of sites. In fact, of the 7 sites evaluated with groundwater concentrations less than GW-2, 4 were found to have unacceptable indoor air impacts. (See also the discussion of indoor air and AULs in Section 4.D.2.)

Conclusions/Options:

DEP will evaluate whether it is necessary to calculate new GW-2 standards or to articulate, in guidance, those site conditions where the existing GW-2 standards may not be protective. In the latter case, the Response Action Performance Standard ("RAPS", 310 CMR 40.0191) would be used to determine the need for additional site investigations into this pathway.

It is recommended that DEP provide guidance on this issue for use in Method 2 and Method 3 risk characterizations. Currently, a number of LSPs have been using the cited 5 x 10^{-4} attenuation factor when evaluating soil gas data at sites. This is clearly inappropriate for chlorinated solvent contaminants.

iii. GW-3 Groundwater

The MCP GW-3 Standards are derived by applying a 10-fold multiplying factor to the US EPA Ambient Water Quality Criteria or other similar values. The factor of ten is a generic factor intended to account for dilution of groundwater contamination as it migrates towards a receiving surface water body and once it discharges into the surface water.

Few LSP or community comments have been received about the development of the GW-3 standards. One area of concern has been the use of unadjusted US EPA LOELs (Lowest Observed Effect Level) rather than dividing by a factor of 10 to estimate a NOEL (No Observed Effect Level) for certain chemicals. The GW-3 standards for such chemicals would be a factor of ten higher (less protective) than appropriate.

DEP staff have expressed several concerns about the GW-3 standards. First, the standard setting process did not consider potential human exposures within the receiving surface water body (e.g., for tetrachloroethylene, concentrations as low as 30 µg/L may be required to be protective of dermal contact exposures during swimming, compared to a GW-3 standard of 5,000 µg/L). Second, the GW-3 standards do not consider potential exposures relating to construction activities. (Private-sector risk assessors have also raised concerns that the high GW-3 standards for chlorinated organics may pose an unquantified inhalation risk if there were to be excavation in or near the saturated zone.) Finally, staff are also concerned that the high GW-3 standards for some chemicals may prevent the identification of sources of OHM. In other words, the GW-3 standard (and thus some Reportable Concentrations) of some chemicals (e.g., MTBE) is so high that you could have a continuing source without triggering further investigation.

Other DEP staff have described the standards *as "scary high*" and have expressed concern that the GW-3 standards "*are short sighted for protection of potential future drinking water resources.*" The latter comment may be more directed to the groundwater categorization process than the actual GW-3 standards, since the GW-1 category is intended to protect drinking water resources, not the GW-3 category.

Conclusions/Options: The GW-3 standard development process should be reviewed to identify areas where the standards may not be sufficiently protective considering both quantitative and qualitative risk concerns.

9. Method 3

a. Environment Risk Characterization

Allowing sufficient flexibility to design and conduct site-specific assessments was a primary consideration in the 1993 regulations and in the supporting guidance. The regulations and guidance together provide a broad framework for environmental assessments, but little specific guidance. The MCP contains no specific language on the kinds of resources and effects that must be evaluated and protected under the MCP. The guidance neither expresses preferences for measurement techniques nor does it fully address the interpretation and extrapolation of measurement data to form a conclusion about risk. This lack of specificity is one aspect of the regulations that should be rectified.

While the broad nature of the regulations and guidance provides tremendous flexibility in designing and conducting risk assessments, it leaves risk assessors, LSPs and PRPs with a great deal of uncertainty about DEP intent and expectations. Under the MCP, most disposal sites are managed by the private sector, without DEP oversight. The design and conduct of risk assessments is determined by the PRP and his/her consultant. Often the extent and quality of the risk assessment depends primarily on the PRP's good graces and understanding of environmental assessment issues and the persuasive powers of his/her consultant. Thus, broadly written regulations and guidance have led to inconsistencies in practice that are unwarranted by differences in site conditions.

For these reasons, focus group participants have advocated expanding the MCP language to require that risk assessments include certain kinds of resources and resource attributes when they are present or relevant at a site. Further, the participants recommended extending the guidance to provide more direction on selecting measurement techniques, interpreting the results and drawing from them conclusions about risk.

In addition, a number of reviewers have recommended extended regulatory language and/or guidance on a number of components of the environmental risk assessment process. These include imminent hazard, substantial hazard, background and local conditions determinations. It will be particularly important to address imminent and substantial hazard determinations in more detail in the regulations. Since these decision points can have an enormous impact on the site management process and serious implications for the regulated community, it is imperative that substantial and imminent hazard determinations be objective in nature and consistent among sites.

b. Public Welfare Risk Characterization

The phrase "Public Welfare" is contained in but not defined in c. 21E or the MCP, nor is it explained in DEP guidance. The regulations (310 CMR 40.0994) approach the characterization of risk to public welfare both quantitatively and qualitatively . As written, the evaluation process raises a number of questions, including:

- How do the separate quantitative and qualitative analyses inter-relate and do these analyses carry equivalent weight?
- Are benefit/cost analyses required, and, if so, using what methodology?
- What does DEP consider "degradation" and/or "degradation of resources directly attributable to the release? " Are private resources considered separately from public resources?
- What is considered a "significant adverse impact?"

The conclusion that a Condition of No Significant Risk to public welfare exists, under 310 CMR 40.0994, appears to be a conclusion about a collective effect upon any community that, as a whole, has been exposed to or is located near a release. There is nothing in Subpart I that expressly defines "public welfare" nor expressly states that the risk of harm being evaluated is the risk posed to an entire community, rather than to a particular person or property.

Historically, "*public welfare*" has been defined to accomplish specific statutory goals and to enhance the protection of public health.[60] Such definitions include the protection, assurance, and enhancement of collective public benefits and public values such as economic prosperity, aesthetics, public convenience, availability of open space, and other "quality of life" indicators.

DEP staff have expressed concern about the vague public welfare standards and many feel that legitimate public welfare issues at sites are not being addressed. LSPs and risk assessors have urged DEP to articulate specific public welfare requirements, particularly for nuisance conditions such as odors.

Conclusions/Options:

DEP should review and revise the regulations to make public welfare evaluations consistent, fair and targeted to the valid concerns of the Commonwealth to protect and enhance public welfare. Otherwise, DEP should remove the public welfare section from the MCP until such regulations can be written.

Specifically, DEP should (a) look to existing regulations that address nuisance conditions, and (b) incorporate language, similar to the Applicability and General Requirements provisions at 310 CMR 40.0901, identifying who the "public" is in a public welfare characterization; that "public" is a collective, not an individual, concept. Such language

[60] M.H. Gordon & Son, Inc. et al. v. Alcoholic Beverages Control Commission et al., 358 N.E.2d 778, Coffee-Rich, Inc. v. Commissioner of Public Health, 348 Mass. 414 422, Mobil Oil Corp. v. Attorney General, 361 Mass . 401, 280 N.E.2d 406, Sperry & Hutchinson Co. v. Director of the Division on the Necessaries of Life, 307 Mass. 408, 30 N.E.2d 269, Liggett Drug Co. Inc. v. Board of License Commissioners of North Adams, 296 Mass. 363. [Additional citations are available.]

would provide for a "big picture" review of the qualitative effects of a release; not upon individual exposure points, but upon a community.

D. Adequacy of RAO Provisions

1. Activity and Use Limitations (AULs)

AULs are implemented at sites[61] to narrow the scope of the risk characterization to all current site uses and activities and certain future site uses and activities, thereby allowing the cleanup of the site to consider only those permitted activities and uses. After a site is cleaned up, the AUL is used to ensure the protectiveness of the remedy over time. The use of land use controls such as the AUL is an innovation of the 1993 MCP. During the development of the MCP, concerns were expressed that activity and use limitations would not be acceptable either to site owners or lenders, but the use of AULs has steadily increased from 104 in FY1994 to a projected 450 this fiscal year, for a total of over 600 filed as of March 1, 1998. Another concern expressed was that they would not be an effective control on future site exposures - a concern that cannot be completely addressed after only five years into the new program.

a. Implementation of AULs

DEP is finalizing its guidance document for implementation of AULs and DEP staff and LSPs are receiving training on AULs. The guidance and training should have a significant impact on the quality of future AULs. Recognizing that limited guidance has been available, when reviewing AULs DEP staff have focused on the administrative completeness of the filing rather than the technical sufficiency of the specific elements. (The regulations[63] clearly specify the requirements of an AUL submittal.)

A cursory review of AULs by DEP during routine audits has yielded a finding that 75% of the AULs filed are administratively incomplete, including

Table 4-13

AUL Submittal Compliance Rate[62]

Has the required element been submitted to DEP?

(Not an evaluation of the quality of the work)

Compliance Rate	
> 90%	Property owner signature
	Signatures notarized
80 - 90%	Form 113
	Survey Plan Book & Page Number
	LSP Signature
70 - 80%	Form 114
	Metes and Bounds or parcel
	LSP Opinion included
	Rationale for AUL in LSP Opinion
	LSP Opinion consistent with permitted and prohibited uses in AUL
60 - 70%	Sketch Plan showing site boundaries in relation to AUL area
	Public Officials notification
	Legal notice publication
< 60%	Metes & Bounds of area subject to AUL

[61] As described at 310 CMR 40.0923 and 310 CMR 40.1012.

[62] Compliance rates are based upon a DEP completeness review of 83 randomly selected sites with AULs.

[63] Primarily 310 CMR 40.1074(2) and 310 CMR 40.1403(7)

some which do not even include required plans indicating portions of the site to be restricted. A file review which examined the administrative completeness of the AUL submittal (again, not the quality of the work) found that the only AUL requirements with a compliance rate greater than 90% were the existence of the PRP's signature and its notarization. Several LSPs have commented that due to the complexity of the AUL procedures, it is impossible to meet the 1-year deadline to RAO (or Tier Classify) when an AUL is chosen. This may explain (but does not forgive) the incomplete submittals. Others have complained that the AUL requirements are exceptionally burdensome, particularly the need to notarize the signatures. While DEP has attempted to simplify the AUL requirements with several regulatory changes since 1993, the complexity of the process is driven by several factors:

- The AUL is a legal document, not simply a submittal to DEP.
- An AUL may have a significant effect on the title of a property and must be carefully crafted.
- An AUL must meet the requirements of real estate laws, which are detailed and complex.

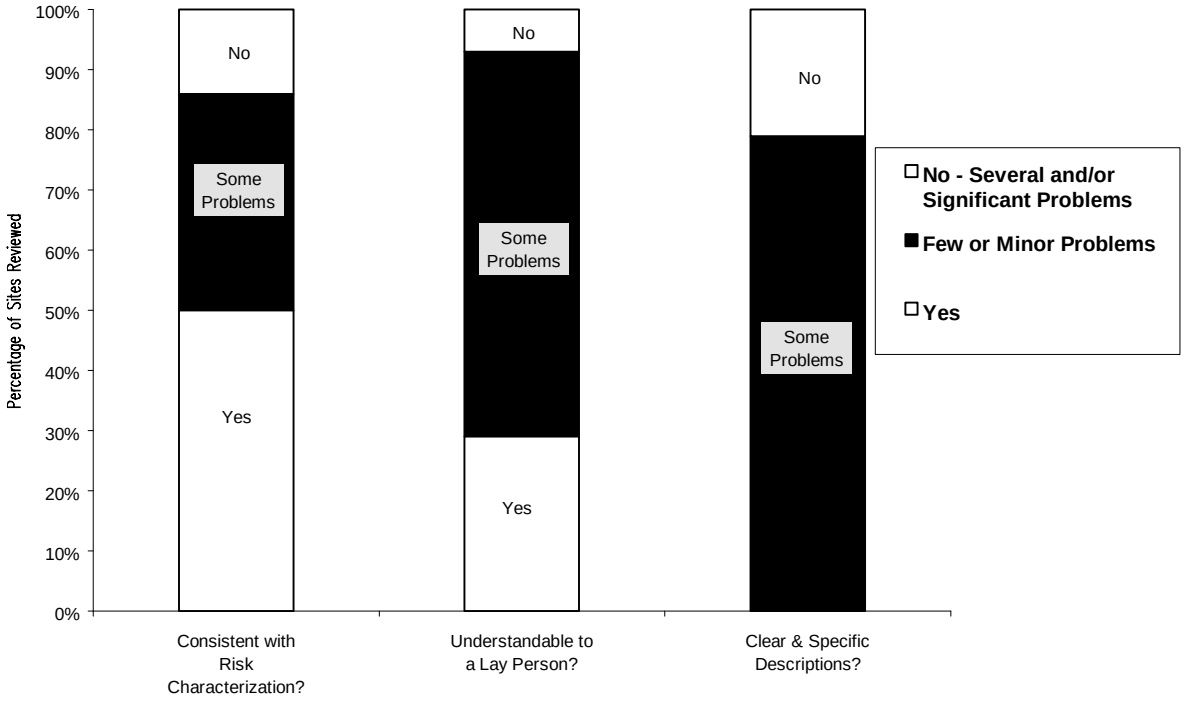
Due to the legal complexities of implementing an AUL, it is likely that LSPs preparing an AUL without qualified legal assistance are working out of their depth.

Since the scope of the site risk characterization may be limited with the implementation of an AUL, DEP has evaluated whether the exposure restrictions/limitations and allowed uses listed in the submitted AULs are consistent with the assumptions made in the corresponding risk assessments (Figure 4-11, first column). Half of the AULs reviewed (50%) were found to have some inconsistencies between the AUL and the risk characterization, and a substantial portion (25%) contained numerous inconsistencies. These problems included:

- not listing any prohibited or allowed uses
- missing important exposure pathways (e.g., one risk characterization did not evaluate exposure to contaminated soil at depth, but the AUL did not prohibit activities such as excavation which could lead to such an exposure)
- missing important receptors discussed in the risk characterization (e.g., construction workers and trespassers)
- misinterpretation of MCP soil categories.

Figure 4-11

AUL/Risk Characterization Evaluation



The AUL is intended to provide notice to future owners/users of the site who may have little knowledge of the MCP. DEP has evaluated whether the language used in the AUL to describe exposure restrictions/limitations and allowed uses would be understandable to a lay person (Figure 4-11, 2nd column). Only 29% of the AULs were thought to be written in a manner understandable to their intended audience. The majority (64%) of the AULs contained descriptions in regulatory terms or technical jargon with insufficient details to clarify their meaning. A few (7%) were written strictly in MCP terms with no examples. Typical examples include:

- References made to "PAHs", "TPH" and the MCP soil and groundwater categories (S-1, GW-2, etc.) with no explanation of the meaning of these terms.
- Note that "*utility or construction work must be conducted in accordance with URAM performance standards, soil management procedures and applicable health and safety practices.*" While MCP citations were provided the AUL provided no detail as to what these requirements might entail.
- One AUL referred only to "310 CMR 40.0000" without indicating which parts might be applicable and why.
- The use of the MCP descriptors for potential exposure (e.g., "*low/high frequency*" and "*low/high intensity*") are commonly used without further description.

As a communication tool, the AUL should be clear as to what are prohibited and allowed uses for the property and provide specific information so that the future owner or user will be able to evaluate their own activities. DEP has found that few, if any, AULs clearly and specifically describe the exposure restrictions/limitations and allowed uses (Figure 4-11, 3rd column): 21% have significant problems while the majority (79%) are unclear/not specific for a few of the permitted/restricted site activities. This is particularly important in cases where the future owner/user may have some obligation to inspect and maintain a site structure (e.g., a parking lot overlying soil contamination). Other examples include:

- The AUL often does not clearly indicate the contaminated area subject to restrictions: the maps, property plans and/or sketch plans are inadequate, inaccurate or simply missing.
- An AUL stated that "*ingestion of surface soils*" is a use inconsistent with the AUL Opinion. No mention is made as to how soils may come to be ingested.
- In one AUL, children are not allowed to "*reside*" at the site for "*extended periods of time or in large numbers*". It is not clear what these limits actually are.

Table 4-14

Do you believe that AULs can truly be enforced to "lock in" site uses to prevent future exposure to contamination left on a site after cleanup?			
	Yes	No	Sometimes
LSPs	48 %	14 %	35 %
DEP Staff	10 %	46 %	37 %

To be evaluated is whether an AUL is effective over time in preventing changes in site use which could otherwise result in significant health, safety, public welfare or environmental risks. This question will become even more critical as property changes hands over the years and the new owners may not be aware that the property was a site. Several commenters noted that compliance with and enforcement of AULs is a significant long-term issue. In fact, nearly half of LSPs surveyed expressed doubts about whether AULs can truly be enforced to prevent future exposure. DEP staff are even more skeptical. With limited history on compliance with AULs, 22% of responding LSPs indicate that they are already seeing some noncompliance with the terms of AULs.

DEP staff have expressed concerned about the trend toward using site-specific (Method 3) risk characterizations with more complex and detailed AULs. Not only are these AULs more difficult for future owners to interpret, but the levels of contamination left behind (in some cases greater than the UCLs) increases the risk of adverse health effects if the AULs are not (or cannot be) followed. LSPs and DEP staff have noted that the AUL requirements are particularly burdensome to homeowners (primarily due to cost) and they suggest developing some means of streamlining the

Table 4-15

In your experience, are private parties complying with the terms of AULs?			
	Most Are	Some Are	Few Are
LSPs	63 %	20 %	2 %
DEP Staff	12 %	42 %	14 %

process. DEP staff have also suggested that most LSPs do not have the expertise to develop AULs themselves and should consult with a conveyancing attorney whenever an AUL is considered.

Conclusions/Options: Current DEP educational efforts (training and guidance) should result in a significant increase in compliance rates for AUL submittals. Detailed evaluation of the quality of the AULs could necessitate a revision of the new guidance as DEP identifies additional problem areas. DEP should conduct site visits to evaluate compliance with the terms of the AULs. DEP should emphasize the need to involve an attorney whenever an AUL is considered/prepared, as an AUL is a real estate legal document. Another option is to limit the use of AULs by describing in regulation any situations under which they would not be considered effective or should not be relied upon due to the uncertainty of effectively controlling future exposures with this tool.

b. AULs and Temporary Solutions

AULs are not currently required for Temporary Solutions.[64] There exist sites with a Class C RAO which may not achieve a Permanent Solution for many years, if ever. Such a situation could lead to unacceptable exposures due to inadequate notice of site use limitations. For example, at a site where a Class C RAO is mandated due to lingering groundwater contamination, soil which has been cleaned to S-3 standards would not be acceptable for unrestricted use, yet no notice of site use restrictions is required. It has been suggested that AULs be required as part of a Class C RAO to provide notice to future site owners, site users, abutters, downgradient property owners, utility companies, etc., that, while no substantial hazard exists, a permanent solution has not been achieved and the use of groundwater or soil restricted.

Conclusions/Options: DEP should consider AULs at sites where a Class C (Temporary Solution) RAO has been achieved.

c. Public Notice of Activity and Use Limitations

While the AUL may provide adequate notice of site use restrictions to future owners of a property, little information is provided to the surrounding community which may be affected by the contamination at the site. The regulations require that local officials be notified of the implementation of the AUL and that a single[65] legal notice be published in a local newspaper, but DEP has found that even these simple measures are not being carried out: at least 33% of AULs submittals recently reviewed by DEP were found to lack at least one type of notice. Consequently, the surrounding community is not receiving notice of the AUL and residual contamination. There are no requirements that abutters,

[64] AULs have been used for some Class C RAOs, most commonly where downgradient groundwater may be affected by contamination or where work on underground utilities may bring workers into contact with the contamination.

[65] Unless the site is a Public Involvement Plan Site. See Section X for more discussion.

downgradient property owners, utility companies, or even easement-holders[66] be notified of the existence of residual contamination which may pose a significant risk under certain circumstances. An AUL is only as good as the audience it reaches, which is very limited. To improve the effectiveness of AULs by requiring that notice be given to these potentially affected classes it is necessary to revise the MCP. However, several LSPs have already expressed concern about potential requirements to notify abutters of AULs, as it may cause confusion and generate numerous phone calls.

Conclusions/Options: DEP should consider that Notices of Activity and Use Limitations be provided to a wider universe of affected individuals and groups, including abutters and easement holders.

d. AULs and Future Buildings

In 1995, due to uncertainties about identifying all properties that would be affected by a migrating plume and the difficulties in getting multiple property owners to implement AULs, the BWSC made a policy decision that indoor air exposures in future buildings need not be part of the evaluation, even though the site may have building potential. Accordingly, AULs are not required to ensure that building construction does not occur in the future in areas where there may be a potential for oil or hazardous material to volatilize from groundwater and affect indoor air.

Several commenters suggest that this policy does not sufficiently protect the health of residents or users of a future building located in an area susceptible to volatilization into indoor air. A common proposal is for DEP to require an Activity and Use Limitation to provide notice of the need to address indoor air concerns should construction occur in the future. (One possibility is to specify in the AUL the requirements for engineered controls, such as vapor barriers and passive ventilation, for any future building.)

The use of AULs is just one means of addressing the issue of indoor air contamination of future building. As described in an earlier section,[67] additional options include expanding the definition of the GW-2 groundwater category and/or specifying that buildable properties include an evaluation of future construction.

Conclusions/Options: DEP should evaluate options for addressing the issue of future buildings at sites, including the option of implementing AULs to prohibit construction or requiring controls to eliminate future risk. Additional options include greater emphasis on source elimination (which would, in theory, result in decreased groundwater concentrations over time) and requiring compliance with GW-2 standards at the property line (while allowing AULs to address future buildings on the source property).

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[66] When a Grant of Environmental Restriction is employed the easement holders are notified (for subordination of their interests), but the use of a Grant is rare compared to the use of the Notice of Activity and Use Limitation which does not require notice to interest holders.

[67] SEE Section 4.C.4.c.ii., Method 1 GW-2 Groundwater

e. AULs and Groundwater

Currently the use of AULs in connection with groundwater contamination is limited.[68] A Grant of Environmental Restriction may be used to change the groundwater category from GW-1 if the only reason site groundwater is considered GW-1 is the presence of a private well. A Grant is required, as is the closure of the well and the connection to a public water supply system.

DEP has received comments calling for the use of Notices of Activity and Use Limitation (instead of the more stringent Grant) for the closure of private wells. It is argued that once the well is closed, a property owner is no more likely to drill another well than is the owner of an adjacent property which is not subject to an AUL. On the other hand, several commenters express concerns about using AULs (even Grants) to prevent the use of the groundwater. For example, in an area of private well use where there is fractured bedrock, an AUL could be used to change the category of site groundwater from GW-1 by eliminating the nearest well[69], but contamination may flow to other private wells through fractured bedrock. In such a case, the AUL would allow far higher levels of contamination to remain in the groundwater, putting the surrounding wells at greater risk. An LSP should, however, recognize the possibility of groundwater flow through fractured bedrock and address this as part of the site investigation.

Conclusions/Options: Since the primary mechanism for eliminating future exposure under such circumstances is the decommissioning of the private well, DEP should review the legal necessity of a Grant of Environmental Restriction vs. A Notice of Activity and Use Limitation. DEP should also conduct site visits to evaluate compliance with Grants which have been implemented.

2. Approaching or Achievement of Background

At sites for which a Class A RAO has been achieved, the LSP must consider the feasibility of approaching or achieving background conditions.[70] This is a statutory requirement[71] which was also in the 1988 MCP. Since the majority of the sites (89%) receiving RAOs since 1993 have achieved some form of a Class A RAO, most RAOs should be

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[68] The previous subsection contained a discussion of the possible use of AULs for sites with GW-2 groundwater (or potential future GW-2 groundwater), but the AUL would still apply to *land* use, not groundwater use.

[69] This assumes that there is access to a public water supply system. If not, the groundwater would continue to be GW-1 due to the distance to a public water supply distribution system (310 CMR 40.0006 (12)). This situation would thus require the presence of multiple private wells in an area served by a public water supplier.

[70] See 310 CMR 40.1020, 310 CMR 40.1035 and 310 CMR 40.1036.

[71] See M.G.L. c.21E §#A(g)

accompanied either by a demonstration that the cleanup has achieved background or that it is not feasible to do so.

As part of the program evaluation DEP has reviewed RAOs from 38% of sites which claim to have achieved background conditions and received a Class A-1 RAO.

Excerpts from 31 Class A-2 and A-3 RAOs were reviewed to assess the "level of analysis" and "appropriateness of logic" which lead to the conclusion that achieving background concentrations in soil or groundwater was not feasible.

While virtually all RAO's reference the MCP[72], either directly by citation or indirectly by content of their statements, to state that the incremental costs [of achieving background] are not justified by benefits, this is rarely supported by a quantitative analysis. Most reports simply state that the site contaminant concentrations are below Method 1 Cleanup Standards and therefore, in the LSP's "professional opinion", further work and expense are "not warranted."

About half of the RAOs end their argument with the above reference, with little or no further discussion. Some added a sentence to the effect that "levels are naturally degrading towards background." About half of the RAOs state that remediation would be unduly disruptive to or prevented by structures, utilities, railroads, etc.

At a handful of sites the evaluation was more detailed:

- Three provided actual cost estimates to remediate and/or restore the site.
- One mentioned disruption to adjacent wetlands.
- One referenced 5/15/96 DEP Issues Paper on achieving background.
- A few provided data showing they are "barely" above background (the PAH sites).
- One made a highly detailed study to statistically evaluate PAH background, performed a detailed Phase III evaluation, and selected a remediation alternative.

Since these excerpts were limited and did not include other work they may have done, this evaluation of "level of analysis" may be biased low. However, only about five out of the 31 RAOs reviewed provided enough detail to demonstrate that the LSP did or even **considered** something more than the "no further action" option.

The evidence appears to indicate that there are two types of sites: those at which achieving background is feasible, and those at which it is not even worth considering reducing OHM concentrations to background levels (i.e., it is "all or nothing" approach to background). Intuitively there should be some fraction of sites where it is feasible to remediate below the minimum cleanup requirements (e.g., the Method 1 standards) and *approach* (but not achieve) background conditions, but the bimodal distribution of sites

[72] See 30 CMR 40.0860(5)(b) and/or 40.0860(7)(a).

indicates that it is rarely done under the MCP. At many sites more could feasibly be done to gain partial movement toward background.

One LSP commented that the requirement to achieve background is problematic and it raises the question of whether DEP really has faith in the risk-based cleanup system. As noted earlier, the statutory requirement to approach or achieve background, where feasible, is considered by DEP to be a qualitative component of the overall risk-based approach, not a challenge to it.

DEP staff believe that more sites cleaned up to background conditions under the old MCP due to the direct involvement of DEP. They believe that clearer criteria are needed so that LSPs and PRPs will know when remediation to approach or achieve background is required. As indicated by the language in the RAOs, LSPs view cleaning up to background as an unrealistic objective which is difficult to define, and drives up costs unnecessarily. Some LSPs noted that a lot of work is done to demonstrate that it's not feasible to achieve background, which results in no real added value. The DEP review appears to refute this statement.

Conclusions/Options: DEP should finalize guidance on the feasibility of approaching or achieving background and consider incorporating elements of that guidance into regulations to increase enforceability of those provisions and to provide regulatory incentives for "approaching" background. Auditors should then expect/require more detailed feasibility evaluations to accompany Class A-2, A-3 and A-4 RAOs. DEP should also formally review a subset of Class A-1 RAOs to evaluate whether the concentrations of contaminants at such sites have, in fact, been reduced to background conditions.

3. Class C RAOs

A Class C RAO, or a Temporary Solution[73], is an option at sites where a level of No Significant Risk does not exist and it is not feasible to implement a Permanent Solution (Class A RAO). Only 2% of the sites at which an RAO has be achieved received a Class C RAO, although the number is likely to rise as open sites approach their 5-year deadline.

Excerpts from 17 Class C RAOs were reviewed to assess the "level of analysis" and "appropriateness of logic" which led to the selection of a Temporary Solution. To achieve an Class C RAO, a Phase III evaluation is required. To complete a Phase III evaluation, an Initial Screening of Likely Remedial Action Alternatives (40.0856) must be conducted. Based on Initial Screening criteria (40.0857(2)), a Detailed Evaluation (40.0858) may be required. This review focused particularly on the Initial Screening and the reasoning used to "avoid" Detailed Evaluation.

Summary findings are:

- Most excerpts were from Class C RAOs, and many referred to the Phase III reports for "details". Most were one to two pages long, a few were several pages long, and a few were only a few sentences.

- In the Initial Screening, most did not address all of the criteria specified in 40.0857(2), and many did not address any. Only three provided an "appropriate" level of detail, of which two had Detailed Evaluations.

- In general, the common trend is "monitor only, doing anything else is too expensive". While monitoring only may be the "best" option for some, very little or no documentation of even **considering** "anything else" was provided. A few, however, did at least perform source removal prior to "monitoring only."

- A few of the petroleum sites referred to natural attenuation as "proven", in support of their "monitoring only" option.

- Feedback received from some DEP auditors confirmed these findings. In addition, one auditor said that the MCP's definition of a condition of No Substantial Hazard[74] (a requirement for an RAO C) is sufficiently vague that "it makes achieving a Class C RAO easier."

In Focus Groups, LSPs noted that Phase III studies are an issue. LSPs believe they know what they need to do to achieve an RAO and can achieve a cleanup using current technologies. They suggested that clarification is needed on what the minimum level of

[73] See 30 CMR 40.1050 and M.G.L. c21E §#A(f).
[74] See Section 4.C.3. for a discussion of Substantial Hazards.

effort is to satisfy the Phase III requirements, since such evaluations are *currently "all over the place in terms of costs to PRPs*."

Conclusions/Options: DEP should evaluate whether, under the regulations as currently written and enforced, the RAO C is used primarily as an opportunity to delay cleanup for five years (or more) without requiring any meaningful investigation into shorter-term cleanup options. Increased emphasis on the existing evaluation criteria by the audit staff and DEP guidance specific to remedy selection would help strengthen the Class C RAO option.

4. Natural Attenuation

"Natural Attenuation" of degradable contaminants appears to be a protective and cost-effective option at certain sites. While the MCP provides a broad framework to incorporate a remedial alternative of this nature, most likely through the filing of a Class C RAO, a more formal recognition and institutionalization of this approach would be desirable.

Conclusions/Options: DEP should consider incorporating natural attenuation into the MCP, possibly in those sections dealing with Class C RAOs, Phase V, or Remedy Operation Status (ROS). Alternatively, it can be given its own status, or perhaps RAO class (e.g., Class C-1 RAO, Class D RAO). At a minimum, broad performance standards must be articulated. Optionally, additional specificity could be provided with respect to implementation and monitoring elements based upon existing publications by the US EPA on *Monitored Natural Attenuation*, and/or ASTM guidance on *Remediation by Natural Attenuation*.

E. Adequately Regulated Sites

The MCP[75] allows sites which may be subject to regulation under both Chapter 21E and another specified state or federal environmental law to proceed with the assessment and remediation under the other directing authority. If such sites are in compliance with the other regulatory requirements *and* meet certain requirements detailed in the MCP, then the sites are considered "adequately regulated" and need not follow many of the procedural and substantive requirements of the MCP. The "adequately regulated" provisions were developed to conserve state and private sector resources and to minimize duplication of efforts.

Contrary to popular belief, the "adequately regulated" provisions do not exempt a site from all MCP requirements. Even if a site is considered "adequately regulated", the MCP requires that the cleanup and public participation requirements be consistent with those required under the MCP, either through an explicit risk characterization (e.g., for Solid Waste management Facilities, 310 CMR 40.0114(1)(e)) or through instructions to DEP on how to handle a site (e.g., CERCLA sites, 310 CMR 40.0111(4)).

[75] 310 CMR 40.0110.

DEP has received few external comments on the Adequately Regulated provisions of the MCP. Internal commenters have noted that, on one level, the provisions are working because people "do not have to serve two [regulatory] masters." Questions have been raised about the effectiveness of the Adequately Regulated provisions, including:

- **Is DEP's Solid Waste program able/willing to pursue contamination beyond the borders of a landfill?** Solid Waste staff have noted that it is enough of a struggle to get a town to close a landfill - never mind dealing with a moving plume.

- **Is the DEP Waste Site Cleanup Program able to assist other state regulatory programs on MCP issues?** DEP Bureau of Waste Prevention (BWP) staff have stated that it is difficult to get BWSC staff to give other programs time to review specific projects, while some BWSC staff believe that the purpose of the "adequately regulated" program was to minimize BWSC staff involvement. BWSC has been described as "not consumer-friendly" to other DEP programs. Regional implementation is not coordinated between Solid Waste and BWSC. It has also been suggested that non-BWSC staff would be better able to use the enforcement provisions of the MCP - and to speed the cleanup of their sites - with additional training.

- **Are LSPs using the MCP to avoid other program requirements?** BWP staff have noted that LSPs will often conduct an IRA under the MCP for a spill and then try to do more under the MCP rather than moving back into the 21C program. BWP staff are concerned about problems being "risked away" under MCP risk characterizations.

Conclusions/Options: While the concept behind the "adequately regulated" provisions are sound, the implementation of these regulations have not received sufficient attention from DEP staff. Greater integration and cooperation between the programs is required to insure that cleanups at sites meet all (21E and non-21E) requirements. If BWP staff are expected to insure compliance with MCP provisions, additional support from BWSC is needed and buy-in from those staff is required.

Chapter 5: Does the Public Have Adequate Public Involvement Opportunities?

Public involvement is an important part of successful cleanups. MGL c. 21E establishes a clear right for citizens and local officials to participate in planning response actions (in section 14), and the MCP establishes specific requirements for informing the public about the status of response actions as well as specific opportunities for public involvement. The MCP requires that the person performing the cleanups must conduct the appropriate public involvement activities and ensure that the MCP requirements are met.

The MCP establishes two levels of public involvement:

- *At all sites* the public must be informed about the risks posed by the disposal site, the status of response actions, the availability of Technical Assistance Grants, and the opportunities for becoming more actively involved in the cleanup process. The person conducting response actions must provide progress reports by sending notices at key milestones in the response action process to local officials, and by publishing specific notices in the Environmental Monitor (for Tier I sites) and in local newspapers.

- *At sites where the public indicates an interest in being more actively involved*, additional activities are designed to solicit public concerns and where possible incorporate these concerns in planning response actions. Citizens can be involved in preliminary response actions at a site within the year after the site is reported to DEP by commenting (in writing or at a public meeting) on the plans for these response actions. Citizens interested in becoming involved in planning comprehensive actions after a site has been tier classified may petition for a site to be designated a *Public Involvement Plan* (PIP) site. A PIP is an agreement between the person conducting response actions and the public about how they will share information, and how the public will be able to comment on plans for assessment and cleanup. At a minimum, PIPs must provide for a *local information repository*, a *site mailing list*, opportunities for *public comment* on all site assessment and cleanup reports submitted to DEP, and *responses to the public comments*. Beyond these basic requirements, there is a great deal of flexibility for the parties to decide how they will communicate throughout the cleanup process.

The evaluation of the public involvement components of the redesigned 21E program focused on two aspects:

- whether, in the context of the "privatized" 21E program (where DEP no longer directly oversees most cleanups, including public involvement activities), sufficient public involvement opportunities are being provided; and

- whether the MCP provides adequate public review so that MEPA review of individual sites is not needed.

To answer these questions, DEP:

1. Conducted telephone surveys with key petitioners for Public Involvement Plan sites throughout
   the state, as well as Licensed Site Professionals (LSPs) and Potentially Responsible Parties (PRPs) for these sites.
2. Mailed surveys to local officials and citizen groups throughout the state.
3. Conducted focus groups with citizens, LSPs, Massachusetts Municipal Association, PRPs, and DEP staff.
4. Reviewed DEP regional site files for documentation copies of notices to local officials on site activities.
5. Correlated Environmental Monitor MEPA Phase III and Phase IV notices with DEP database information on sites in Phase III and Phase IV.
6. Reviewed Notices of Audit Findings for sites where the public had indicated an interest in being involved.

Are the Public Involvement Activities in the Redesigned 21E Program Adequate?

To address this question, both how the public gets information about sites (and the availability of public involvement opportunities) and how well the specific opportunities for public participation in response action planning are working must be examined.

Providing Information: In general, DEP has found that, in many cases, information about key milestones in response actions is not reaching either local officials or citizens. In many cases, the requirements to notify local officials of major milestones in the response action process are not being complied with. In other cases, documentation that these notices have been provided was not submitted to the agency. Better compliance was found with requirements to notify local officials and the public of tier classifications, since documentation of these notices has to be submitted with a Tier I permit application, and the application is not considered to be administratively complete without this. However, for other types of submittals, the best compliance rate indicates that these requirements are not being met in about a third of all cases.

LOCAL OFFICIAL NOTIFICATION	*NUMBER OF FILES REVIEWED*	*NUMBER WITH COPIES OF NOTICES*	*NUMBER WITHOUT COPIES OF NOTICES*	*PERCENT COMPLIANCE*
Phase II	**35**	**24**	**11**	**69**
Phase III	**17**	**8**	**9**	**47**
Phase IV	**4**	**0**	**4**	**0**
Release Abatement Measure	**37**	**12**	**25**	**32**
Response Action Outcome	**157**	**90**	**67**	**57**
Downgradient Property Submittal	**19**	**8**	**11**	**42**
Activity and Use Limitation	**62**	**41**	**21**	**66**
AUL Legal Notice	**64**	**43**	**21**	**67**

These findings were generally confirmed by a review of 448 Notices of Audit Finding, which noted that local officials were not notified of major milestones (or the documentation was not provided to DEP) in 15% of sites audited.

Some local officials reported (via focus groups and DEP's written survey) that, when they received notices of major response action milestones, the notices were hard to understand, and the local officials did not know how the notices could be useful to them. Local officials who had been notified of field work did not indicate whether this information was helpful to them. Citizens reported worrying about how they can find out if contamination extends beyond a source property (particularly in residential neighborhoods, and neighborhoods relying on private wells).

The MCP requirements for publication of notices of the availability of Phase III and IV plans for Tier IA and IB sites in the Environmental Monitor were designed to provide broader public notice of these specific milestones in response actions at the most environmentally important sites. These requirements replaced a Memorandum of Understanding developed with the MEPA Unit in the Executive Office of Environmental Affairs in 1988, which established an alternative way for 21E response actions to comply with the MEPA regulations (before 1988, an Environmental Notification Form was required for response actions meeting certain thresholds that had been developed before the 1988 MCP was promulgated).

A review of notices published in the Environmental Monitor revealed similar non-compliance with the MCP requirements specifically designed to ensure that response actions comply with MEPA, as shown below:

	Plan Filed With DEP*	***MEPA Notices Published***	***% Compliance***
Phase III (Remedial Action Plan)	**79**	**24**	**30**
Phase IV (Remedy Implementation Plan)	**32**	**9**	**28**

* Note: These numbers represent the number of Tier IA and IB sites for which a Phase III or Phase IV was submitted to DEP since October 1993.

Citizens responding to DEP's survey indicated that they are most likely to find out about 21E sites in their community by reading articles in their local newspaper, or by talking with their neighbors or a representative of an environmental advocacy group. Most reported that they *do not read* either legal notices in their local newspapers or the Environmental Monitor. Some citizens reported that they use DEP's World Wide Web site to find out whether there are sites in their community, but some of these respondents noted that they have had difficulty in downloading information from the Web page.

Public Involvement in Planning Response Actions:. The MCP establishes a relatively informal process for public involvement in preliminary response actions (which are frequently planned and implemented quickly) and a more formal process for sites undergoing comprehensive response actions.

The process for becoming involved in the development of preliminary response actions was added to the MCP in 1995, in recognition of a need for communication where citizens are concerned about a) the impacts of these response actions on them and their property, and b) how these

response actions will lead to either a completed cleanup (with a Response Action Outcome Statement) or in tier classification and comprehensive response actions. To date, these opportunities have not been widely used: citizens have requested them at only 5 sites. With so little experience, it seems clear that DEP should be publicizing these opportunities more widely, and evaluating their effectiveness when more experience with them has been gained.

With respect to involvement in comprehensive response actions, citizens reported that they found out about the opportunities to get involved by talking directly with DEP staff, or by talking with a representative of an environmental advocacy group, and not from reading legal notices published in local newspapers, which are the primary methods the program uses to provide this information to the public. At the same time, it is evident that some people do read legal notices because they have been cited as the source of information about petitioning for designation of a site as a "Public Involvement Plan" site.

There are currently 175 sites across the Commonwealth that have been designated as "Public Involvement Plan Sites", or "PIP Sites" (please note that several of these sites include multiple properties, but one public involvement plan has been prepared to address communications comprehensively. The most notable of these are the Massachusetts Military Reservation on Cape Cod, and the General Electric Site in Pittsfield which has affected riverfront and other properties along the Housatonic River). At most of these sites, PIP designations have been made in response to petitions filed by residents of the communities in which the sites are located or by local officials. DEP has made these designations without a petition in only 2 cases (in both cases, these designations were based on DEP's awareness of widespread community concern about and interest in cleanup plans; the agency did not wait to receive a petition). Most of these sites were designated as PIP Sites before the redesigned program started operation in 1993 (PIP designation has been available since the first MCP was promulgated in 1988).

Public Involvement Plans establish a blueprint for communications between the person conducting response actions at a site and concerned citizens and local officials. At a minimum, they must include a description of the site and response actions performed to date, specific ways in which information will be provided to the public (e.g., via an information repository, fact sheets mailed periodically to a mailing list, periodic briefings for local officials, etc.), specific opportunities for the public to comment on plans, and specific commitments to respond to comments from the public. These plans must be prepared by the person conducting response actions (based on interviews with citizens and local officials to identify specific concerns that should be addressed). The plans are reviewed by the public, revised based on comments submitted, and implemented throughout the rest of the response action process.

Citizens and local officials feel that PIPs serve some important purposes: they provide information about a site that might not be available directly to citizens of that community in any other way, and the public meeting that is required for presentation of the draft PIP is seen as an important opportunity for the public to find out what has already happened at a site and what they can expect in the future. However, the PIPs prepared without DEP involvement have also run into some difficulties:

- DEP's guidance for preparing PIPs is thought to be outdated and not particularly useful. It would be helpful to have a policy from DEP that could be used to help establish consistent expectations about what the PIP process can and cannot provide for both citizens and PRPs.

- while citizens see the initial PIP meeting as useful, Plans frequently do not provide for additional opportunities for face-to-face communication, even when the public requests them (via the community interviews that must be done prior to preparing a draft plan). At the same time, PRPs for sites that have been designated as PIP sites reported in interviews that they have spent more than $20,000 on preparation of a PIP; these expenditures are not seen as adding value to the response actions at the site. Some PRPs have had their LSP or attorney manage the public involvement process; if these professionals are not sympathetic to the public's need for clearly-presented information and real opportunities for communications, the public has become particularly frustrated.

- in some cases, citizens have petitioned for PIP designation when all they really want is a locally-available copy of the site file and periodic updates on progress. They do not review or comment plans and reports, and the comment periods can slow up the response actions. Some citizens have noted that DEP's site files are not convenient for members of the public, and have asked whether the agency could set up evening file review opportunities.

- in some cases, local interest has been intense when the site first comes to the public's attention (with large public meetings and many comments on reports), but has waned as response actions progress toward selection of a remedy and the development of construction plans, particularly when this process takes several years to complete. There is not now a clear mechanism for adjusting PIP activities based on the level of public interest.

- in some cases, the required community interviews indicate that the real public issues at a site are not related to assessment and cleanup, but are more focused on proposed redevelopment. The PIP process does not provide new opportunities for the public to affect the future use of a site, beyond addressing questions of whether the cleanup will make the site safe for whatever use is planned. This leads to frustration for both citizens and the PRPs, since the PIP process is not an effective vehicle for addressing these concerns.

Once a PIP is finalized and implementation starts, other difficulties have arisen:

    - one common complaint is that public comments and specific requests for information do not get addressed by the people conducting response actions. In some cases, the public believes that site information provided by the public to LSPs was not been considered, and in some cases the public felt that their information was dismissed or discounted without clear explanation. In other cases, the public has felt that LSPs have been reluctant to provide citizens with information.

    - at several PIP sites, the public has serious concerns about whether the full nature and extent of contamination has been identified. This dispute comes up where people worry about off-site contamination, and at sites with long (and diverse) histories of industrial

uses, where environmental conditions may be complicated. At these sites, many citizens do not understand why DEP is no longer involved, and believe that independent reviews of private sector response actions are needed.

- there are sites where the public perceives the risks for health and the environment to be more serious than that presented by the LSP. Unless a real dialogue is established for these issues, controversy develops and can continue throughout the response actions.

- even at PIP sites, the availability of information for public review can remain problematic: libraries that house information repositories can become overloaded and frequently do not have the resources to organize or catalogue documents.

In general, more than half of citizens responding to our surveys believe that, in their cases, their involvement in response action planning was less than satisfactory for them. Of citizens who are involved in response actions at sites where DEP was at one time overseeing the response actions but is not now, fully 80% believe that their involvement has been negatively affected by DEP's departure.

Does the MCP provide sufficient opportunities for public review of response actions?

The answer to this question depends on whether local officials and the public have adequate opportunities to obtain information about the existence of a site and the status of response actions, so that people can decide whether they want to review and comment on reports and/or become more directly involved in cleanup planning. The discussion above identifies several problems with the existing public notification requirements in the MCP. If ways can be found to provide status information more directly to people who could be interested, then they could exercise the existing opportunities for review. DEP would be interested in suggestions for better ways to notify the public of the existence of sites and of the status of response actions.

Suggestions for Improvements

Public notices of response actions:

- DEP should not accept submittals from PRPs unless they contain documentation that the required notices have been provided to the appropriate local officials and newspapers.

- DEP should find better ways to notify citizens of sites, particularly once there is evidence of off-site contamination. Legal notices should probably continue to be used (because some people read them and, since they are "paid advertising", they are certain to be published) but there should be some way of notifying citizens of the existence of sites and the opportunities for involvement in response action planning *before* tier classification. However, other avenues for providing these notices should be explored (e.g., press releases, notices posted in municipal offices, individual notices to abutters of contaminated property).

- The opportunities for public involvement in IRAs and RAMs should be much more widely publicized (perhaps in conjunction with the above recommendation).

- DEP should educate LSPs and local officials about the public notice requirements and opportunities, the role of LSPs and the agency, the LSP Board, etc.

- Since the notices that have been published in the Environmental Monitor do not seem to be read by the public, the MCP should drop these requirements. This would be in line with recent proposed revisions in the MEPA regulations, which have dropped all references to thresholds for 21E response actions.

Public Involvement in Planning Response Actions:

- There should be a way to involve a neutral third party in resolving disputes between the person conducting response actions and the public. DEP plays this role formally at Tier IA sites, and staff has spent considerable time on other sites that are either "pre-classification" or are classified as Tier IB, Tier IC, or Tier II.. Some people have suggested that the agency could get more formally involved in public disputes at other sites without having to review and oversee the full range of private sector response actions. DEP has some reservations about this, since the controversies usually involve disagreements about whether the site has been adequately characterized and the risks adequately evaluated. If the agency does not become formally involved at disputes at sites that are not classified as Tier IA, then DEP could consider making Technical Assistance Grants available on a fast-track (and outside the annual grant cycle) for dispute resolution, or could consider using bond funds (if available) to make the services of state mediators available.

- DEP should expand and update its guidance for PRPs on how to develop and implement PIPs in the privatized program.

- The PIP process should be made more flexible, so that if citizens only want some of the mandated activities the PRP should only have to provide what people want. Also, there should be a formal process for adjusting activity levels if public interest wanes.

Technical Assistance Grants

DEP provides Technical Assistance Grants (TAGs) to citizen groups, municipalities and water supply districts, which use the money to hire experts to help them better understand technical information and to participate more fully in cleanup decisions.

As part of the program evaluation, DEP sent a survey to everyone who had applied for a TAG. A majority (72%) of citizens and environmental advocates who responded believe that TAGs have resulted in a better understanding of site cleanup actions. A majority (65%) also believe that this has in turn resulted in them having more influence over site assessment and cleanup decisions. However, most (73%) local officials surveyed believe that TAGs have had only a moderate to

slight effect on their ability to better understand and influence site assessment and cleanup activities. Citizen respondents also believe that TAGs have slightly improved their relationship with PRPs, while the majority of local officials (64%) do not believe that TAGs have affected their relationship with the PRPs in any way.

In terms of administrative requirements, citizens, environmental groups and local officials all rated the ease of following the TAG administrative requirements favorably (i.e., contract scoping, payment voucher process, legal entity formation, subcontracting and reporting). The exception is the citizens' responses to the legal entity formation, which 45% rated as unfavorable. A request for more assistance on the legal entity process was also voiced in focus groups with citizens.

The table below summarizes TAG program activity. In three funding rounds DEP has awarded 42 TAGs to 30 different groups: 37% site-specific citizen groups, 26% municipalities, 20% to preexisting community groups, 17% to environmental groups. These groups represent 15 Tier IA, 3 Tier IB, 2 Tier IC, 22 Tier II sites, 2 National Priority List (NPL) sites and an Adequately Regulated solid waste landfill. This data also indicates that the pool of TAG recipients is becoming less diverse. The most recent funding round awarded 12 TAGs. Of the TAGs awarded, seven groups (58%) had received at least one other TAG, and 4 of these received a TAG in each funding round. Overall 29% of TAG recipients have received more than one grant and half of those have received funding in each of the three rounds completed. Several grantees did not use all their TAG funds, because either the project was completed under budget or the project changed direction upon implementation.

Funding Round	TAGs Awarded	Total Dollar Amount	# New Groups	# Repeat Groups
1	16	$141,150	16	NA
2	14	$140,000	9	5
3	12	$120,000	5	7
Total	42	$401,150	30	12

Citizens who responded to DEP's survey and participated in focus groups had several suggestions for improvements they would like to see in the TAG program. The most frequently voice comment was that the pot of funds for these grants should be larger than $100,000/year, so that grants could be awarded to more groups in each funding round, and also so that individual grants could provide more than $10,000. While DEP would like to make TAGs available to all eligible organizations, there are limitations (through the agency's annual bond fund spending cap) on large the pot of funds can be in any given year.

Citizens have also suggested that TAGs should be available citizens and municipalities to conduct their own environmental sampling and analysis, which is currently not allowed by the program. DEP continues to believe that this has a high likelihood of creating separate and conflicting sets of data describing conditions at sites, and could only work where the independent sampling and

analysis was conducting using precisely the same protocols/analytical methods, etc. as the PRP's sampling work. If precisely the same protocols are to be followed, it would appear to be a better use of state funds for the TAG recipient to develop and put forward the arguments for sampling in specific areas or analyzing for a wider variety of contaminants, and not to duplicate work.

A similar suggestion has been made that TAG funds should be available to cover the costs of legal counsel for citizen groups. The TAG program currently allows funds to be used for legal advice about public involvement in the response action process, but does not allow funds to be used to support adversarial proceedings. DEP wants TAGs to be used overall to help citizens get constructively involved in planning for response actions, and does see the need to use scarce state funds to support adversarial actions in general -- if anything, TAGs should reduce the need for litigation.

There has been another suggestion that DEP make available "mini-grants" of $500 or so for groups applying for a TAG to hire a consultant to prepare their application for them. This is an interesting suggestion, but would raise some questions in terms of state contracting procedures, which only allow the state to reimburse for funds already spent. DEP understands the need that some groups have expressed for help in pulling their application together, and has worked with the Toxics Action Center to help that non-profit organization provide this service.

Suggestions for Improvement:

- DEP should consider making TAGs available prior to Tier Classification of a site. While the state's contracting procedures (which DEP as a state agency must use) probably do not lend themselves to rapid funding decisions that would be required to provide TAGs for time-critical response actions, it might be possible (if funds were to be available) for DEP to set up a contract under which a variety of environmental specialists could be made available to eligible citizen groups and municipalities. The contractors would technically be employed by DEP, and may not be seen in the community as "independent" (since the group would not hire them directly). But, the expertise could be made available as needed on this type of basis.

- Expand outreach to municipal, environmental and community groups to increase the diversity of the TAG applicant pool.

- Provide more assistance to TAG recipients to direct them to resources available to help them establish their group as a legal entity (e.g., Secretary of State's Office, Toxics Action Center).

Chapter 6: Is the Program Cost-Effective?

Crafting environmental programs so they are cost-effective and result in measurable benefits is important both for those who pay environmental compliance costs and for the environment. Clearly, those who conduct assessments and cleanups want to be able to do so in the most cost-effective manner. At the same time, the environment benefits from cost-effective rules since they lead to higher compliance rates and -- assuming compliance is linked to benefits -- better environmental protection.

As part of the program evaluation DEP solicited information about response action costs and suggestions for making the MCP more cost-effective. Unfortunately, the data needed for a comprehensive cost/benefit analysis is not easy to obtain. DEP does not require private parties to file cost data with the agency. DEP was able to obtain some cost data from public sources and through anecdotes which provide some light on the costs questions.

A number of questions about the cost of assessment and cleanup were included on surveys DEP sent to program stakeholders. As presented in Table 6-1 below, respondents' experience with the program influences their view of the issue. About 70% of LSP respondents from large firms and sole practitioners believe that the cost for assessment and cleanup was "better" (i.e., more cost-effective) under the new program than under the old, while 47% of LSPs at small firms, 32% of DEP staff, and 29% of environmental consultants believe costs have improved. Approximately 30% of DEP staff and environmental consultants believe costs were worse. This perception may be related to the sizes of releases that each group of respondents handle. Several respondents specifically noted that the cost of cleanup at larger sites had improved but "small spills are definitely more costly." One respondent noted one 20 gallon spill that had cost $12,000 to clean up. Another mentioned a figure of $5,000 to cleanup a 12 gallon spill. While these may be atypical examples, they demonstrate that a small release, if not immediately contained, can cost a significant amount to clean up relative to the size of the release.

Table 6-1: In the new 21E program has the cost of assessment and cleanup changed for the better, the worse or stayed the same?[76]

	Better	Stayed the Same	Worse	Unsure
All LSPs	65%	16%	16%	4%
• **LSP - Sole Practitioner**	70%	20%	10%	0%
• **LSP - Small Firm**	47%	22%	31%	0%
• **LSP - Large Firm**	71%	14%	11%	5%
DEP	32%	18%	30%	21%
Environmental Consultant	29%	43%	28%	0%

[76] The survey response rate is 138 LSPs (10 sole practitioners, 32 from small firms, 86 from large firms), 54 DEP staff, and 38 environmental consultants

Site owners, many of them homeowners, felt strongly about the costs of assessment and cleanup. (See Table 6-2). One respondent noted that a 500 gallon waste oil tank that got water in it cost over $25,000 to cleanup. Another homeowner noted that he had spent over $50,000 to remove a leaking underground oil tank from his backyard. An LSP noted that a fuel line leak of 100 gallons can cost a homeowner $60,000 to clean up. Overall, 31% of site owners thought the cost of assessment and cleanup was "poor." A little over half of the site owners indicated that the cost of assessment and cleanup was "OK," and 13% said it was excellent.

Table 6-2. Based on your experience with redesigned program, please rate the cost of assessment and cleanup.[77]

	Excellent	Ok	Poor	Unsure
Site owners/operators	13%	53%	31%	4%

Surveys seemed to note a general trend toward increased costs for assessments but decreased or unchanging costs for remediation (See Table 6-3 and Table 6-4). One respondent attributed the increased assessment costs to "all the paper work required and LSP fees." Another respondent noted that risk assessment costs are high when dealing with situations where there are no existing standards, such conditions requiring ecological risk assessments, sediment contamination, determining background for metals and ubiquitous urban lead. However, respondents reported that in other cases "LSPs are using risk assessment more to reach a cost-effective solution to contamination problems."

Table 6-3. How has the cost of assessments changed under the new program?

	Decreased	Stayed the Same	Increased	Blank
All LSPs	19%	25%	56%	1%
· **LSP - Sole Practitioner**	20%	10%	70%	0%
· **LSP - Small Firm**	22%	31%	47%	0%
· **LSP - Large Firm**	17%	24%	57%	1%
DEP	23%	23%	32%	23%
Environmental Consultant	18%	14%	50%	18%

Table 6-4. How has the cost of remediation changed under the new program?

	Decreased	Stayed the Same	Increased	Blank
All LSPs	37%	39%	23%	1%
· **LSP - Sole Practitioner**	50%	20%	30%	0%
· **LSP - Small Firm**	47%	34%	19%	0%
· **LSP - Large Firm**	31%	43%	24%	1%
DEP	26%	30%	23%	21%
Environmental Consultant	32%	25%	25%	18%

Survey results on the cost of legal services associated with cleanups were mixed. The general trend suggested that roughly one third of all groups thought that costs decreased, stayed the

[77] 394 site owners/operators responded.

same, and increased. The exceptions were for LSP sole practitioners, half of whom believe the legal fees stayed the same, and LSPs at small firms with 41% of the respondents believing that legal fees had decreased. DEP staff and environmental consultants believe legal fees have increased but about a quarter of these two groups chose not to respond to this question.

Table 6-5. How have legal costs changed under the new program?

	Decreased	Stayed the Same	Increased	Blank
All LSPs	34%	32%	29%	6%
· **LSP - Sole Practitioner**	20%	50%	20%	10%
· **LSP - Small Firm**	41%	25%	34%	0%
· **LSP - Large Firm**	33%	33%	28%	7%
DEP	16%	23%	37%	25%
Environmental Consultant	18%	18%	39%	25%

Survey respondents from all groups clearly stated that the PRP's budget "greatly" influences assessment and remedial actions at sites. This statement was agreed to by the majority of DEP staff (86%) and environmental consultants (57%) responding. This response seems intuitive since most businesses are not going to perform assessment or remedial services if they are unlikely to get paid. In addition, if site owners or operators are only willing to pay for a certain component of the cleanup, the LSP has no real mechanism to force a site owner to complete the entire cleanup process. Enforcement measures are left up to DEP. Thus, LSPs and consultants with clients with limited budgets (or limited willingness to spend) may not be able to meet MCP standards. Several LSPs mentioned site owners ending contracts with them because the site owners refuse to pay for actions required by the MCP. Other LSPs have noted that when this occurs, less-scrupulous professionals will take over the projects. Several voiced concerns that DEP needs to perform more audits and take enforcement actions against shoddy assessment and cleanup activities.

Table 6-6. To what extent does the PRP's budget for response actions influence the assessment and remedial actions chosen for the site.

	Greatly	Somewhat	Slightly	Blank
All LSPs (128)	47%	41%	10%	2%
· **LSP - Sole Practitioner (10)**	50%	30%	20%	0%
· **LSP - Small Firm (32)**	50%	38%	13%	0%
· **LSP - Large Firm (86)**	45%	43%	8%	4%
DEP (57)	86%	9%	0%	5%
Environmental Consultant (28)	57%	32%	7%	2%

Labor Rates

A significant component of the cost of cleanups is the cost of labor. DEP compiled labor rates for sixteen different waste site cleanup contractors from bids sent to the Executive Office of Environmental Affairs for the "Underground Storage Tank Testing Contract" (See Table 7). This contract is part of the Clean State Initiative (Executive Order 350), whose goal is to ensure that state agencies abide by the same environmental rules that other responsible parties must adhere to.

These labor rates were also compared to the Reimbursement Fee Schedule Policy of the 21J Underground Storage Tank Petroleum Product Cleanup Fund and bid schedules for several publicly funded projects the DEP is involved in. All of the labor rates evaluated fell into the same range as indicated in Table 7. The only exception was for Clerical (Administrative Assistants), for which the 21J Fee Schedule uses a figure of $35 per hour.

Table 6-7 - Labor Rates for Waste Site Cleanup Contractors

JOB TITLE	PAY RANGE
Professional Level 4 (Senior program managers, LSPs, PEs, and Principals)	$75.00 - $130.00
Professional Level 3 (Project Managers, Sr. Scientists, Sr. Risk Assessors, and Sr. Technical leaders)	$65.00 - $96.00
Professional Level 2 (Staff Scientists, Engineers, and Risk Assessors)	$50.00 - $75.00
Professional Level 1 (Junior Scientists and Engineers)	$40.00 - $60.00
Clerical (Secretaries, Administrative Assistants, Data Processors)	$20.00 - $25.00
Based on UST Contract Fall 1997 Bid Schedules	

As Table 6-7 indicates, the pay range widens with an increase in Professional Level. Certified Professionals (LSPs, PEs) and Principals found in Professional Level 4 command the highest wages and have the widest range in pay ($55 dollars per hour range). The average wage for Professional Level 4 is $103 per hour and the mode is $100 per hour.

Lower professional levels have less of a gap in pay. The Professional Level 3 pay range is $31; Level 2 is $25; Level 1 is $20; and Clerical is only $5. When compared to the average wage of Professional Level 3 ($80), the added cost of a certified professional (Level 4) increases the hourly wage by an average of $23. A comparison of the mode of Professional Level 4 with the mode of Professional Level 3 reveals a difference of $25.

Comments from stakeholders reflect the general sentiment of higher costs associated with the required use of LSPs. One person commented that "LSP insurance costs have gone up so LSP rates have doubled." Some commenters believe the cost of cleanup has increased "because of all the paper work required and LSP fees." The person who noted that it cost $25,000 to take care of "a 500 gallon waste oil tank" reported that 66% of the cost was for reports and the LSP's Opinions.

Table 6-8 - Mean/Mode Labor Rates

	Mode	Mean
Professional Level 4	$103	$100
Professional Level 3	$80	$80
Professional Level 2	$62	$55
Professional Level 1	$48	$45
Clerical	$25	$25

Property owners feel particularly susceptible to labor costs. One property owner noted that "the cost to property owners has increased mainly from the LSP portion of the job." Another property owner simply stated: "LSPs are very expensive and may encourage people not to work within the system due to prohibitive cost." For small spills, in the old program DEP closed out cases; all the PRP had to do was hire the cleanup contractor. In the new program, PRPs need an LSP to ensure that the site is closed out, which is often an additional labor cost.

Laboratory Costs

A potentially significant contribution to any waste site cleanup is the cost of sample analysis. Survey respondents noted that "lab data can drive up costs." DEP reviewed laboratory rates imposed by the same 16 contractors used for the "Underground Storage Tank Testing Contract" discussed above.

Laboratory costs have large cost ranges (See Table 6-9). Several analytical methods have cost ranges double to triple their lowest rate. For example, VOC Method 634 has a cost range from $80-$170. The highest value ($170) is more than twice the lower value ($80). Similarly, PCB Method 608 and 8080 have cost ranges from $45-$149. The highest value ($149) is more than triple the lower value ($45).

Some of the largest cost ranges are for VPH, EPH & VPH/EPH analyses which went into effect on October 31, 1997. The larger ranges found in these methods may be attributable to the greater demand for these services since the new regulations took effect. Survey respondents also noted this trend. Specifically, they mentioned that "the new VPH/EPH standards have increased costs."

Table 6-9 Laboratory Costs Method (reference SW846)	Cost Range
VOC Method 634	$80-170
VOC Method 8240	$80-170
VOC Method 601	$35-94
VOC Method 8010	$35-100
VOC Method 602	$35-100
VOC Method 8020	$35-113
PCB Method 608	$45-149
PCB Method 8080	$45-149
ABN Method 625	$205-370
ABN Method 8270	$205-370
PAH Method 610	$65-190
PAH Method 8100	$65-190
TPH Method 418.1	$35-80
TPH (GC/FID)	$56-109
RCRA Metal Method 200	$75-134
RCRA Metal Method 7000	$75-134
VPH	$72-200
EPH	$80-250
VPH/EPH	$160-350

The larger cost range may also be a reflection of how the analysis is performed (i.e., whether the sample is being analyzed for just the fractional range of hydrocarbons or the fractional range plus the target analyte). An attorney who responded to the survey stated that "[t]here is a huge difference in lab costs, which gets reflected in LSP proposals. Some LSPs will not use a particular lab because of concerns about quality, while other LSPs will use the lab." The implication seems to be that quality lab data costs more than data that may not be of high quality.

Average labor rates (Table 6-8) for Professional Levels 1- 4 were compared with average laboratory costs. Of the 16 firms reviewed, six firms charge below average labor rates but above average laboratory fees. Four of the 16 firms charge above average labor rates but below average lab fees. Two firms charge above average labor rate and above average lab fees. Only 1 firm charges below average labor rate and below average fees. Three firms had mixed results which included labor rates and lab costs above and below average. Based on this limited data, two business practices were seen: those companies that charge more for labor tend to have lower analytical costs and those companies that discount labor tend to have higher laboratory costs.

Financial Inability Filings

In the new program PRPs who are financially unable to perform response actions can apply for Financial Inability Status, for which DEP is starting to implement formal procedures. Upon review of the application, if DEP determines that the next response action is beyond the PRP's financial ability to perform, the Financial Inability Status gives the PRP a defense against penalties that DEP may issue for noncompliance with an MCP response action timeline. The Status provides a "parking place" in the MCP and gives DEP enough information to decide whether to spend state money to continue response actions where public health and the environment is directly threatened.

Financial Inability Status applications are an indication of difficulties in paying for 21E actions. To date, DEP has received 110 requests: 37 are from homeowners and 73 are from businesses. Since the program has just begun to be implemented, it is too early to tell whether there are a significant number of PRPs who are unable to fund response actions.

Opportunities to Make the MCP more Cost-Effective

In general, while noting that cleanups are often expensive, stakeholders indicated that the MCP does not appear to be unnecessarily driving up cleanup costs, since costs are now controlled by risk-based decisionmaking by LSPs. However, DEP received a number of comments about areas that should be examined for cost-effectiveness:

1. Several stakeholders questioned the need for LSPs at small spills. In many cases in the old program, a cleanup contractor would clean up the spill in a matter of hours, and DEP staff would close out the spill soon afterward. Today the PRP for a small spill must hire an LSP (often after the release has been cleaned up) to review the contractor's work and prepare an RAO Statement. While the value of the LSP's Opinion in these cases is to bring the site to closure, the costs may be out of proportion to the benefit. One suggestion was the development of a "standard quotes" document for these types of situations. Another suggestion was to raise the Reportable Quantity for some oil spills from 10 to 25 gallons. At this time, DEP believes LSPs should be required for all reportable releases, and will continue to look for ways to lower costs.

2. Several LSPs pointed out that more timely DEP audits would reduce the cost of cleanup. These LSPs felt that if DEP audited earlier in the cleanup process, any resulting deficiencies or violations would be easier to fix. Some of this concern should be addressed by the proposed changes to the audit program (see Chapter 3, Audits).

3. Cleaning up to background conditions was mentioned as an "unrealistic objective" since background is difficult to define and the value added to clean up beyond "no significant risk" standards is questionable to some respondents. Most sites do not clean up to background, but still have to go through the exercise of showing that it is infeasible. Chapter 21E requires that cleanups approach or achieve background to the extent feasible. The science of risk characterization is imprecise and cleaning up to background where feasible ensures the elimination of risks. DEP is addressing the requirement to approach or achieve background through the development of guidance on determining the feasibility of achieving background (see Chapter 4 for a discussion of this issue).

4. The lack of accepted and clear standards for some situations was said to unnecessarily drive up costs in a number of areas. In particular, areas cited include the lack of sediment standards, the difficulty of performing ecological risk assessments, background concentrations of metals, and dealing with ubiquitous urban lead (see Chapter 4 for a discussion about developing additional standards).

5. While 1996 MCP revisions that limit the areas in which groundwater cleanups need to achieve drinking water standards have been well-received, the continuing requirement to clean up to drinking water standards even where some believe it is unlikely that the contamination would ever have an effect on drinking water supplies was cited as creating unnecessary costs. Several LSPs have argued that drinking water standards should not apply to every exposure point in a Zone II, but a demonstration should be required to

show that, by the time contamination reaches the well, it would meet standards (see Chapter 4 for a discussion of this issue).

6. The public involvement process was mentioned as another area sometimes significantly drove up costs. Several PRPs stated that it was too easy for a site to become a Public Involvement Plan site, which could increase the total costs for a site cleanup by $100,000. This cost is often seen as unwarranted, especially since the public's interest often quickly wanes after the initial PIP meeting, but the cost of maintaining PIP activities remains high. One suggestion was to create an exit point from the PIP process if the public loses interest (see Chapter 5 for a discussion of this issue).

7. Inconsistency between DEP regional offices was indicated as a factor that sometimes increases costs. It was noted that some regions will allow certain remedial actions to occur but other regions will not, requiring a more costly alternative (see Chapter 1 " Accelerated Risk Reduction" for a discussion of this issue).

Chapter 7: How Should the Success of the Program Be Measured?

Developing environmental indicators for state cleanup programs has been particularly challenging. Part of the difficulty is that cleanups take place at many discrete locations. Changes in concentrations of various contaminants and receptor exposures can be measured at a given site. However, in most cases (and especially in urbanized areas), it is very difficult to look at the status of the area's soil, groundwater, surface water and air, and trace changes in that status back to a particular site. The quality or status of these environmental media is usually the result of a number of regulatory and private actions. For example, groundwater in an area may certainly be degraded by a release which c. 21E requires to be cleaned up, but this groundwater may be equally (if not more so) affected by a number of septic wastewater disposal systems or a neighboring landfill. The groundwater can be sampled, but if the contaminants from the different sources are the same (or break down into the same chemicals over time), it will be difficult to say with any certainty whether the improvement in groundwater quality comes from cleaning up the 21E release or fixing the septic systems.

The one environmental medium for which cleanups do have directly measurable results is soil. Most releases have at least some effect on surrounding soil, and while it is certainly possible that several releases (or other problems) can all contribute to an area of contamination, the remedies usually involve cleaning up that particular volume of soil (by excavation and on- or off-site disposal, or by treatment).

In spite of these difficulties, state cleanup programs across the country are working on the development of environmental indicators, partly as a response to an on-going federal effort, and partly to measure their own success. Therefore, EPA and the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) formed a task force to develop recommendations for environmental indicators that state/territorial and federal cleanup programs could use to report progress. DEP has participated in this task force since its inception. The Task Force, which expects to report to states during the Summer of 1998, has used the following goal for cleanup programs as the basis for its discussions:

" Prevention, reduction and management of risk resulting from the exposure of releases of hazardous substances and petroleum products from contaminated sites into the environment."

The task force is identifying specific indicators for each environmental media that oil and hazardous materials releases typically affect (i.e., soil, groundwater, surface water, and air), and is developing a recommendation for measuring changes in the status of each media. However, the task force has also recognized that, as noted above, the status of any environmental medium can be affected by many actions in addition to site cleanup, and that, at present, there do not exist mechanisms for tracing changes in groundwater, surface water and air directly back to a particular site. Therefore, until data is available from all the environmental programs that affect a particular aquifer or surface water body, the task force is recommending that cleanup programs use descriptions of *program outcomes* and *program outputs* as proxies for measuring true changes in environmental status.

The task force's recommendations for "target" environmental indicators are:

Groundwater: Number/size of aquifers and other groundwater structures (or portions thereof) that have been restored so that they can support all uses for which they have been designated (e.g., drinking water, irrigation, support for ecosystems in receiving surface water bodies, etc.).

Surface Water: Number of stream miles and size of area of other surface water bodies that have been restored so that they can support all uses for which they have been designated (e.g., drinking water, recreation, aquatic life, etc.).

Air: Size of area in which air quality has been restored to levels that protect human health and the environment (for many site cleanup programs, this may measure restoration of indoor air in buildings and enclosed structures that has been affected by volatile contamination in soil and groundwater; there are few sites which have affected overall ambient air quality to a measurable degree).

For each of these media, the task force is recommending that the following program outcomes and outputs be tracked as proxies for changes in environmental status:

Program Outcomes: The number of sites that have affected each of the above environmental media (i.e., groundwater, surface water, or air) where those impacts have been remediated or controlled.

Program Outputs: 1) The number of sites that have affected each of the above environmental media where the impacts have been identified; and 2) The number of sites that have affected each of the above environmental media where the nature and extent of the impacts has been assessed and delineated.

As noted above, the one environmental medium where changes in quality can be directly attributed to specific cleanup actions is soil. The Task Force's recommendation for tracking progress in soil cleanups reflects this difference, and proposes two environmental indicators for this medium:

1. Acres of land restored to be available for safe use by people (including continuation of on-going activities and redevelopment); and

2. Acres (or other area measure) of critical habitat and natural resources restored.

The program outcomes and outputs identified above could also be used to indicate progress toward soil cleanup.

DEP is considering adoption of the task force recommendations, and solicits public comment on them.

Chapter 8: How can the MCP be streamlined?

As part of the program evaluation, DEP solicited comments on where the regulations should be streamlined. This chapter includes a list of suggestions that DEP has received for making the regulations work better and to clarify and simplify the regulations. DEP will is reviewing these suggestions and seeks comments on additional areas that could be streamlined or improved, especially areas where stakeholders believe the MCP requires more time, effort or cost than is necessary to meet the goals of the program will be identified and evaluated for change.

Subpart A

- Definitions
    - Clarify definition of "Hot Spot"
    - Clarify definition of "Non-Aqueous Phase Liquid (NAPL)" (e.g., what does "continuous" mean?)
    - Clarify definition of "Substantial Hazard;" categorically include uncontained migrating NAPL
    - Make the Non-Potential Drinking Water Source Area designation more flexible, in particular with regard to the 100-acre rule.
- Add minimum QA/QC reporting requirements to the Environmental Sample Collection and Analyses section (40.0017)
- Remediation waste
    - Clarify remediation waste regulations.
    - Require Hazardous Waste Manifests used for 21E remediation waste to be filed with BWSC.

Subpart B

- Adequately regulated - Clarify requirements for landfills, which are poorly understood.

Subpart C

- Allow release notification retraction for sites where contaminants are shown to be background.
- Add discovery of surface water contamination above acute Ambient Water Quality Criteria (AWQCs) to the 2- or 72-hour reporting category.
- Add Substantial Release Migration to the 72-hour reporting category.
- Imminent Hazards
    - Add more detailed description of Imminent Hazards for ecological and human health
    - Strengthen the regulatory linkages regarding the IH process.
- LRAs
    - More clearly state the purpose of LRAs
    - Increase LRA soil limits (i.e., from 100 to 200 cubic yards for petroleum)

Subpart D

- Clarify regulations concerning Substantial Release Migration.
- Narrow situations that would be considered Substantial Release Migration (e.g., tie to risk).
- Provide more incentives to at least control the migration of groundwater and/or effect some level of remediation (e.g., a property boundary "point of compliance" approach)
- Reduce amount and frequency of IRA, URAM, and RAM reports.
- Allow more bundling of response actions / generic plans covering large facilities (e.g., for a facility that may conduct dozens of URAMs each year), with biennial or annual progress reports (in place of individual submittals for minor activities).
- Clarify how to link releases to existing RTNs.
- Allow oral RAM approvals for construction activities which encounter contamination.
- Broaden the scope of activities allowed for URAMs (i.e., don't limit to underground utilities but expand it to all types of construction activities).

Subpart E

- Allow sites which do not require comprehensive response actions to not Tier classify even if they are in the system more than one year.
- Replace default Tier IB status with a different "out-of-compliance" status.
- Combine Tier IB and IC categories
- Allow downgrading of sites after Phase III.
- Vary timelines for different types of sites.

Subpart G

- Eliminate extra public notice requirements for proposed permit decisions (the public has already been notified of permit application).

Subpart H

- Clarify how an ongoing RAM can be converted into the Phase IV final remedy for a site.
- Tighten up the cost/benefit portion of the feasibility analysis (it's currently too easy to justify not doing cleanup because it costs too much)
- Make explicit a bias for remediation in the Phase III evaluation of remedial alternatives

Subpart I

- Allow flexibility to achieve a permanent solution where contamination is above GW-standards in an IWPA or Zone II but it is shown that there is no threat to the public well.
- Allow the closing of a private well to get out of GW-1 without requiring a Grant of Environmental Restriction.

- Add Contaminant of Concern criteria and require justification for elimination of chemicals.
- Allow Method 1 standards to screen out Contaminants of Concern under Method 3.
- Adopt ASTM natural attenuation guidance for sties that cannot meet Method 1 standards.
- Copy EPA and other states and require the use of the 95th percentile Upper Confidence Limit on the mean concentration rather than a straight average.
- Method 1
    - Develop standards for indoor air, sediments, and surface waters
    - Make explicit the requirement to determine if Method 1 is applicable at a site. Must justify why/why not pathways are appropriate
    - "Residential" S-1 soil depth
        - ⇒ Change soil depth limit to 10 ft, and/or
        - ⇒ Make the depth flexible, with justification, and/or
        - ⇒ Use the depth to groundwater as a cut-off point if shallow
    - Add common chemicals to the Method 1 list (e.g., copper, 1-methylnaphthalene, pyridene); delete 2-methylnaphthalene (now covered by VPH/EPH)
    - Revisit standards for chemicals which are not based solely on risk; e.g., lead, PCBs, and zinc.
    - Revisit the soil-to-groundwater leaching standards, which may not be sufficiently protective due to inappropriate dispersion model parameters.
    - Consider incorporating the soil-to-indoor air pathway
    - Adjust the MTBE standards to consider new information
    - Be more explicit about how to determine Exposure Point Concentrations and require documentation of EPCs to be explicit
    - GW-2
        - ⇒ Apply GW-2 standards at property line as point-of-compliance and/or
        - ⇒ Apply GW-2 standards to any groundwater less than 15 ft depth
        - ⇒ Require AULs for future buildings
        - ⇒ Adopt soil vapor standards (see CT)
- Method 3
    - Clarify Public Welfare section.
    - Incorporate "local conditions" concept, including assessing human health risks associated with surface water and sediment
    - Clarify where drinking water standards must be met.
- Identify specific assessment endpoints for ecological risk assessments to be applied to different habitat types.

Subpart H

- Require collection of risk assessment information early in the process, since this is often not done.
- Add more explicit standards for operation and maintenance

Subpart J

- Require RAO reports to stand on their own, so that DEP auditors do not have to look at multiple other status and completion reports.
- Require AULs for Class C RAOs
- Require more specificity in AULs about type, depth/media, and levels of contamination left on site.
- Add a clear process for re-opening RAOs
- Clarify what procedures must be followed when additional cleanup is needed after an RAO has been filed (e.g., as part of construction activities)

Subpart N

- Require PRPs to submit site reports to municipalities upon request.
- AULs
  - Require notices of site information to abutters (e.g., for AULs)
  - Require AULs to be filed with local Assessors' Offices.
- TAGs
  - Allow Technical Assistance Grants prior to Tier Classification.
  - Require PRPs to provide site information directly to TAG advisors upon request.
- Notices
    - Notices sent to municipalities should be more detailed and explain what is happening at a site.
    - Require PRPs to issue press releases annually, starting soon after notification
    - Require notification to abutters in place of legal notices

Subpart O

- Revisit scoring system to better reflect relative hazards
- Change language in NRS to score only for those chemicals present due to a release of oil or hazardous material
- Eliminate Section 6 where the LSP can subtract 50 points.

Subpart P

- Develop a concentration-based exclusion for Ethanol (which is not flammable in an aqueous solution, but currently must be reported due to flammability when more than the RQ is spilled). Also, re-examine the RQ for Ethanol based on chemicals with similar characteristics.
- Raise the mineral oil RQ.
- Raise the oil RQ to 25 gallons
- Raise the RQ for unlisted corrosive and ignitable substances from 10 lbs to 100 lbs (currently, isopropanol's RQ is effectively 10 lbs because it is unlisted, which is lower than comparable chemicals)

Fee Regulations

- Eliminate compliance fees for homeowners
- Eliminate Downgradient Property Status fee
- Restructure fee program -- perhaps move to all submittal-based compliance fees. Reward sites that do more cleanup with lower fees (i.e., a Class A-1 RAO would have a lower fee).
- Change Tier IA compliance fees to a flat fee.

CHAPTER 9: Evaluation of the Board of Registration of Hazardous Waste Site Cleanup Professionals

The 1992 legislation that redesigned the 21E program established a new state licensing board to license and regulate private sector experts in site assessments and cleanups. That licensing board, the **Board of Registration of Hazardous Waste Site Cleanup Professionals**, is commonly known as "**the LSP Board**." Because of the Board's major role in helping to implement the new 21E program, the Board was established within the Executive Office of Environmental Affairs rather than within the Division of Registration, which administers 32 of the state's other licensing boards.

The Board consists of 11 members: the Commissioner of the Department of Environmental Protection or his designee, and 10 other members appointed by the Governor to overlapping four-year terms. Besides the Commissioner of DEP or his designee, there are 5 LSPs, 3 members of statewide environmental organizations, a non-LSP hydrogeologist, and a labor representative. (Attachment 1, at the end of this chapter, is a list of the current members of the Board.)

As is the case for any professional licensing board, the LSP Board has two primary functions: (1) to establish licensing standards and review licensing applications and (2) to establish and enforce rules of professional conduct that all licensees must meet to ensure that they practice in a satisfactory manner that protects the public.

Since its establishment in 1992, the LSP Board has adopted regulations (309 CMR 1.00 *et seq.*), developed a licensing application, developed and administered a licensing examination, and licensed 494 LSPs. Now that the Board's licensing program has been established, the Board spends most of its time investigating professional conduct complaints against LSPs and taking disciplinary action against LSPs when warranted.

Any comprehensive evaluation of the 21E program must include an evaluation of at least the key components of the LSP Board's operations. The Board has examined three broad questions for this evaluation:

- **Is the Board licensing only those who are competent to practice as LSPs?**
- **Has the Board (in conjunction with DEP) taken adequate steps to ensure that LSPs are practicing in a satisfactory manner?**
- **Is the Board adequately funded and staffed, and does it use its resources effectively and efficiently to accomplish its responsibilities?**

This chapter describes the LSP program and the results of its evaluation. Please note that, as with DEP's evaluation, the Board's review and recommendations have been designed to satisfy the requirements of Executive Order 384.

PART I -- BACKGROUND

The LSP program was developed from three sources: the Study Committee established by DEP that recommended the concept behind the 21E redesign, an LSP Advisory Committee established by DEP to develop a framework for this program while the redesign legislation was proceeding through the Legislature, and the redesign legislation itself. This section describes the contributions made by these sources.

Study Committee Recommendations: In its 1990 *Interim Report*, the 21E Study Committee described how the 21E program could be redesigned to operate more effectively and efficiently by reallocating responsibilities between DEP and the private parties obligated under G.L. c. 21E to assess and clean up sites. A key feature in this reallocation of responsibilities was the recommendation that sites which posed relatively less risk and/or complexity would no longer require DEP approvals for response actions. Instead, each PRP would be required to meet all the requirements and deadlines set forth in the MCP and would also hire an experienced environmental professional, licensed by the Commonwealth, to coordinate the work and ensure that adequate assessments are performed and appropriate cleanup decisions are made and implemented. These "licensed site professionals," as they came to be called, would provide "opinions" to DEP at various key points in the process stating that the work had been done in accordance with the MCP's requirements. Their clients would be able to rely on these opinions and move forward to complete their cleanup obligations.

The Study Committee proposed four purposes for these licensed site professionals:

- to enlist the consulting community's considerable expertise in assessing and cleaning up sites to enable the private sector to deal with more sites at a faster pace than they could under the pre-existing 21E program;

- to provide DEP and the public with confidence that assessment and cleanup actions performed by PRPs without DEP oversight are adequate;

- to provide DEP and the public with confidence that the scope of response actions are determined by the conditions of the site and not entirely by the PRP's budget; and

- to make the private sector accountable for the quality of technical work for response actions.[78]

In the Study Committee proposal, licensed site professionals would oversee the work of other technical specialists and would integrate their work to ensure complete assessments and permanent cleanups. A licensed site professional could be self-employed, work in an environmental consulting firm, or be employed directly by a PRP.

To ensure that the "opinions" rendered by licensed site professionals would meet the requirements of the MCP and protect public health, safety, welfare and the environment, the Study Committee recommended that DEP audit a percentage of these opinions. This would also give the opinions more credibility, allowing them to be relied upon by PRPs, the public, buyers and sellers of property, and lenders.

[78] 21E Study Committee's *Interim Report* (1990), Sec. 4, p. 35.

To be licensed as licensed site professionals, applicants would be required to have significant experience managing or supervising response actions. The Study Committee also recommended that the licensing board establish professional conduct standards for licensed site professionals, which should include a requirement that licensed site professionals apply all appropriate technical standards as well as all applicable regulations.

The LSP Advisory Committee: The initial conceptual work of the Study Committee was advanced considerably by the Licensed Site Professional Advisory Committee, created by DEP in 1991 while the "redesign" legislation was being considered by the Legislature. This Committee was asked to recommend the specific licensing and professional conduct standards for licensed site professionals (now commonly referred to as "LSPs"). The Committee recommended that the Board consider the following framework for licensing requirements:

- issue licenses that would be valid for three years;
- require a stringent application process for all applicants, without "grandfathering" any class of applicants;
- establish different application requirements for applicants with listed technical degrees (Standard Track) and those without listed technical degrees (Alternate Track);
- require that applicants in each Track meet minimum educational requirements to obtain a license, and that all LSPs meet basic continuing education requirements for license renewal; and
- require that all applicants pass an examination which would demonstrate their knowledge of the MCP.[79]

The Advisory Committee concluded in its *Report* that persuasive arguments could be made in favor of issuing more than one type of LSP license (one for assessment work, one for remediation, and a third for risk assessment). Nevertheless, it did not pursue this idea because its charge was to recommend the licensing requirements for a single LSP license. It recommended, however, that the Board revisit this matter after more information became available.

The Advisory Committee also considered the development of professional conduct regulations. Specific considerations included the changing nature of waste site cleanup technology, frequent advances in scientific knowledge, the LSPs' varied backgrounds, and the inherent difficulty in describing subsurface site conditions. Unlike accountants, who follow standards promulgated by an independent board, LSPs do not have the benefit of any single set of technical guidelines to use as a basis for professional action. Developing technical guidelines for the diverse tasks LSPs are called on to perform would require the LSP Board to develop numerous sets of technical standards to guide the professional actions of LSPs. As an alternative, the Advisory Committee recommended (a) that at a minimum LSPs must meet a general standard of care that requires them to act with reasonable care and

[79] Advisory Committee's *Report* (1992), Sec. 2, p. 6.

diligence and (b) that LSPs themselves must judge their own expertise and abilities and limit their personal involvement when the work at a site falls beyond their area(s) of expertise. In such instances, LSPs must rely on the expertise of others who the LSP has judged to be qualified. Thus, the rules place much of the responsibility for ensuring each LSP's technical and managerial competency with the individual LSP. The Advisory Committee's goal for the professional conduct requirements it recommended was to establish a profession with public credibility so that LSPs' opinions would have weight in commerce.

With respect to rules regarding the professional responsibilities of LSPs, the Advisory Committee recommended, among other rules, that in providing professional services LSPs must "hold paramount" the protection of public health, safety, welfare, and the environment[80]; "exercise independent professional judgment"; and "follow the standards and procedures" set forth in the applicable provisions of Chapter 21E and the MCP."

1992 Redesign Legislation: The 21E redesign legislation added sections 19-19J to M.G.L. c. 21A. This law established the LSP Board and gave it specific responsibility for licensing LSPs and regulating their professional conduct. The enabling legislation also established the degree of oversight that LSPs must provide over work at sites before they can provide "opinions" to DEP regarding that work:

- For opinions about assessments, an LSP must either (i) manage, supervise or actually perform the assessment, or (ii) periodically observe the performance by others of such assessment.

- For opinions about containment or removal actions, an LSP must either (i) manage, supervise, or actually perform the action, or (ii) periodically review and evaluate the performance of the action by others.

In all cases, the LSP must determine whether the work completed has complied with the provisions of Chapter 21E and the MCP.[81]

The legislation mandated that the Board's standards for licensing LSPs and regulating their professional conduct be designed so that LSP opinions protect public health, safety, welfare, and the environment.[82]

The Governor appointed the initial members of the LSP Board in 1992. Drawing on the conceptual principles developed by the Study Committee and the Advisory Committee, and drawing extensively from the Advisory Committee's recommended regulations, the LSP Board promulgated its initial set of regulations in early 1993. *See* 309 Code Mass. Regs. 1.00 *et seq.* These regulations were amended in 1995 to clarify certain points. However, the basic licensing standards and rules of professional conduct have not changed since their original promulgation in 1993.

[80] This recommendation was borrowed from the professional conduct rules governing Professional Engineers.
[81] G.L. c. 21A, § 19.
[82] G.L. c. 21A, § 19B.

LSP Role: During discussions with the Study Committee and LSP Advisory Committee, expectations held by various stakeholders about the role that LSPs would play in the redesigned 21E program were discussed at length. By the time the 1992 legislation was enacted, a consensus had emerged: LSPs would be experts who provide services to the people responsible for cleanup to ensure that assessments and remedial actions comply with DEP's regulations. LSPs would in some cases be directly employed by the party who is responsible for the site (e.g., on staff); in most cases, however, it was expected that they would be consultants, either employed by a consulting firm or working independently. In some cases, LSPs would actually perform response actions. In other cases, they would oversee the work of others (e.g., co-workers at the LSP's environmental services firm, contractors with specific expertise in specialized areas of knowledge, and excavation equipment operators). LSPs would not be agents of DEP or extensions of the agency's staff, although in the redesigned program the agency would need to rely on their opinions, as would other stakeholders.

Consideration was given to the responsibility that environmental professionals who became LSPs would take on for a site once they were licensed, and whether, if they were to be the sole party accountable for assessment and cleanup decisions, they would be able to obtain professional liability insurance and other things generally required by professionals practicing in today's market. By the time the 1992 legislation was enacted, a consensus had been reached that the parties who are liable or potentially liable under c. 21E would continue to be responsible in the redesigned program for making sure that work at their site complied with DEP's requirements. In general, LSPs would have to comply with the MCP, but their responsibility to DEP would be somewhat limited by the fact that PRPs would continue to have responsibility for their sites. However, LSPs would be accountable for meeting the Board's rules of professional conduct and be subject to disciplinary action by the Board when they failed to meet those standards. At the same time, as with other professionals (including engineers, attorneys and accountants), there would be limited circumstances when LSPs would be held directly accountable for their decisions. In general, the basic framework used by the committees developing this program and adopted by the Board was drawn from the long history of engineering practice.

Licensing Requirements: To be licensed as an LSP, the Board's regulations require that a "Standard Track" applicant have earned a college or graduate degree in a field of science or engineering, possess good moral character, and have 8 years of "total professional experience," 5 years of which must constitute "relevant professional experience." To accommodate those who have practiced in the environmental field for many years but who are not college graduates, the Board also licenses "Alternate Track" applicants who have at least a high school diploma and who have earned 14 years of "total professional experience," 7 years of which must constitute "relevant professional experience."

- "**Total professional experience**" is defined in the Board's regulations as "experience applying scientific or engineering principles in the environmental, scientific, or engineering fields where the resultant conclusions form the basis for reports, studies and other similar documents."

- "**Relevant professional experience**" is experience that an applicant has gained serving as a "principal decision maker" on waste site assessment and/or cleanup projects. A "principal decision maker" is defined in the regulations as "an individual who regularly bears all or a

significant portion of the responsibility and accountability for the overall conduct of one or more major components (site investigation, risk characterization, remediation) of response actions at disposal sites." Having responsibility only for sub-tasks (e.g., field exploration) does not count.

Once an applicant's written application has been reviewed and the Board has determined that the applicant has demonstrated that he or she has met the education, experience, and good moral character requirements, the applicant is approved to take the Board's licensing examination. That examination consists of 160 graded multiple-choice questions, and it tests the applicant's knowledge of both technical and regulatory matters pertinent to waste site cleanup work in Massachusetts.

In general, all LSPs are senior-level environmental professionals who have at least 5 years of decision-making experience at disposal sites and a broad range of technical and regulatory knowledge about assessment and remediation of hazardous waste sites in Massachusetts.

Continuing Education Requirements: To ensure that LSPs keep abreast of the myriad technical and regulatory developments in the rapidly changing field of waste site cleanup work, the Board's regulations mandate that LSPs obtain continuing education by attending at least 48 hours of Board-approved courses every three years. When LSPs apply to renew their licenses every three years, they must submit documentation proving that they have attended the requisite number of hours of continuing education courses.

LSP Professional Conduct Standards: The Board's Rules of Professional Conduct (309 CMR 4.00) address matters of professional competency, professional responsibility, conflict of interest, and contingent fees. They require LSPs to

- exercise independent professional judgment;
- follow the requirements and procedures of Chapter 21E and the MCP (including the Response Action Performance Standard);
- make a good faith and reasonable effort (1) to identify and obtain all readily available relevant and material facts, data, reports, and other information describing conditions at a site and (2) to obtain additional data and other information necessary to discharge their professional obligations; and
- to act with reasonable care and diligence, and to apply the knowledge and skill ordinarily required of licensed site professionals in good standing practicing in the Commonwealth at the time the services are performed.

LSP Opinions: Once they are licensed, LSPs are hired by PRPs to provide "waste site cleanup activity opinions" that are filed with DEP at various required points in the cleanup process. These opinions state that, in the professional opinion of the LSP, the response action that is the subject of the opinion was developed and implemented in accordance with all of the applicable provisions of Chapter 21E and the MCP. The enabling statute requires that before an LSP can submit an opinion, the LSP must have provided a requisite degree of oversight with respect to the work that was done. Often this means that the LSP is managing or supervising the work, planning what needs to be done and overseeing its

execution. In other cases, it means that the LSP periodically reviews and/or observes the work as it is being done by others.

DEP Audits of LSP Opinions: M.G.L. c. 21E requires DEP to audit a percentage of the LSP opinions that are filed each year to verify that the response actions have in fact been performed in accordance with Chapter 21E and the MCP, and to provide the public with confidence in the integrity of the redesigned program. When, as a result of these audits, DEP finds work that was not done in accordance with the MCP or that is deficient in other ways, the agency typically notifies the PRP and specifies the corrective action that must be taken.[83] DEP may also file a formal disciplinary "complaint" with the Board when its audit reveals substandard LSP work that may warrant Board disciplinary action against the LSP.

The Board's Disciplinary Program: The Board receives and investigates complaints from DEP, PRPs and the public that allege that LSPs have violated one or more of the Board's Rules of Professional Conduct. If the initial investigation reveals that there are "sufficient grounds" to initiate disciplinary action, the Board may commence an adjudicatory proceeding to impose a private or public censure or to suspend or revoke the LSP's license. In certain instances, the Board can also impose an administrative penalty (a fine) on the LSP.

Creating a New Profession: There are three attributes that distinguish members of a "profession" from members of an occupation that is not a profession: a duty to protect the public, a high level of competence in a field of expertise, and a high standard of ethical behavior. In redesigning the MCP and beginning to license LSPs, DEP and the LSP Board attempted to create a new profession. It was hoped and expected that LSPs would, over time, view themselves as members of a true "profession," demonstrating through their conduct a recognition that their duty to protect the public and maintain high standards of technical competence and ethical behavior ranks over personal gain in their hierarchy of values and goals. It was further hoped that the profession would mature in a manner that would result in a "higher" level of professional practice over time. That is still the goal.

That new profession is now almost five years old, and it is beginning to mature. Most LSPs have begun to view themselves as members of a new profession, and the Licensed Site Professional Association (LSPA) has been formed to promote sound business and technical practices by LSPs. The LSPA has worked closely with DEP in co-sponsoring a series of continuing education courses pertaining to the MCP, and it has joined with DEP and the Board in facilitating the referral of LSP fee disputes (between LSPs and their clients) to providers of alternative dispute resolution services. Through its monthly newsletter, the LSPA educates LSPs about DEP's audit and enforcement actions, the Board's disciplinary actions, and other issues of interest to LSPs.

This program evaluation affords a valuable opportunity to look carefully at LSPs and the status of the LSP profession, to determine whether this profession is heading along the track its conceptual designers, DEP, the Board, and the public expected of it, and to determine what changes, if any, are needed to improve the performance of LSPs.

[83] DEP is currently considering expanding the universe of problems in which it would direct enforcement action specifically against response action contractors and LSPs (see Chapter 2).

PART II -- LSP BOARD PROGRAM EVALUATION

Issue #1: Is the Board licensing only those who are competent to practice as LSPs?

A. Status of Licensing By the time the new 21E program became operational in October of 1993, the Board had licensed 294 LSPs.[84] The number of LSPs has grown steadily but slowly ever since. Now, almost five years later, there are 494 LSPs. The Board has been receiving between 80 and 120 applications per year.[85] The Board has not received any complaints that it has licensed too few LSPs to enable the new 21E program to work.

From the summer of 1993, when the Board first began reviewing license applications, through December of 1997, the Board reviewed 891 applications and approved 67% of them. One-third of all applications filed with the Board have been denied. (A year-by-year breakdown of this data appears in Attachment 2 for this chapter.

Thus, it appears that the Board's application requirements are in fact screening out a significant number of applicants. Only about two-thirds of those who apply are approved to take the licensing examination.

The reason for denial in almost every instance is that the applicant lacks 5 full years of "relevant professional experience." In many cases these applicants need only a few more months or a year of "relevant professional experience," and they re-apply after obtaining that additional experience. In other cases, applicants are rejected because their experience, while in some way related to hazardous waste, does not directly involve overseeing the conduct of assessing and cleaning up hazardous waste sites or was not at the level where they were making significant decisions about assessing and cleaning up sites.

The Board's licensing exam, which is given only to those whose applications have been approved, appears to be a challenging one, as a significant percentage of those who are approved to take it do not pass on the first try. The Board has now administered six examinations. No two exams have been identical; each contains a different mix of questions. Yet each exam has produced a pass rate of between 65% - 85%. The overall pass rate is 74%.[86] A total of 175 examinees[87] have failed to pass one of the Board's exams, while a total of 494 applicants have passed an exam.

Many (but not all) of those who fail to pass on the first try pass on a subsequent try, apparently because they have studied for the second one more thoroughly. Thus, even though a low percentage of

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[84] Each applicant whose written application was approved before November 1995 was awarded a Temporary license, pending the Board's development and administration of a licensing exam. All Temporary licensees were required to take and pass one of the Board's first two exams in order to become Full licensees.

[85] Applications may be declining. During the last half of 1997, the Board received only 29 applications, and in the first 6 months of 1998 the Board received only 17 applications.

[86] This does not include the June 1998 exam, which is still being graded.

[87] An "examinee" is defined as a test taken, not an individual. Thus, an individual who has failed two different examinations is counted as two "examinees."

those who are approved to take the exam fail to pass in the end, the Board believes the exam serves a beneficial purpose by forcing applicants to study the MCP and the technical areas of LSP practice that may be less familiar to them, thereby raising the overall knowledge base of those licensed as LSPs.

Of those few who were unable to pass an exam, no generalizations could be made. They came from large and small firms. Some had many years of experience and others had fewer years of experience. Their only link was that they failed to demonstrate on one or more exams that they possessed sufficient technical and regulatory knowledge to practice competently as LSPs.

The Board acknowledges, however, that this data about its license application process does not answer the question "Is the Board licensing **competent** people?" In order to answer that question, the Board has utilized the Program Evaluation process to examine the data that DEP has regarding LSP performance to assess what it may suggest about whether the Board is licensing the right people.

B. Analysis of data obtained from Program Evaluation

The Board has examined the data that DEP has shared with the Board during the course of the Program Evaluation. Specifically, the Board examined the data from DEP's data bases, audit inspection results, written surveys, and focus groups. The Board's analysis of this data with respect to whether it is licensing competent LSPs is described below.

First, reports from DEP generally indicate that the redesigned 21E program has achieved most of the goals it sought to achieve. (See earlier chapters of this GEIR.) This suggests to the Board that its licensing process is at least generally ensuring that most LSPs are adequately qualified to practice.

Second, data from DEP's recent survey of PRPs indicate that the vast majority of them are pleased with the quality of LSP work. 93% of the PRPs responding reported that the quality of their LSP's work was either excellent or satisfactory. This data also supports the conclusion that most LSPs appear to be adequately qualified.

Third, the Board examined the data obtained from DEP's recent Notice of Audit Finding Review Project (described in Chapter 2 of this GEIR). Focusing on the data obtained from the 228 random audits, which the Board believes to be more indicative of how LSPs are performing generally, the Board noted that 167 (73%) were deemed adequate and did not require further field work. Of the 52 cases in which additional field work was required and has been completed, the Board noted that in 23 cases the work confirmed the original LSP opinion, in 15 cases the LSP's original opinion had to be modified, and in 14 cases the LSP's original opinion ended up being rejected.

Fourth, the Board examined additional data obtained from DEP's recent survey of LSPs, DEP staff, and other stakeholders. (See complete survey results in Appendix 1.) In the Board's view, the responses received from the 128 LSPs and 57 DEP staff who responded reveal a significant difference in opinion with respect to how well LSPs are performing and whether the Board's licensing standards are stringent enough. For example, it appears that of the 52 DEP staff who responded to this question, 52% believe that the LSP Board's licensing standards are not stringent enough. By contrast, only 25% of the 126 LSPs who answered this question agreed with this view.

Based on its examination of this limited data, the Board believes that while most LSPs appear to be generally qualified to practice competently, there may be a number of LSPs who are, at least occasionally, not practicing competently. How large that number is cannot be determined from this data. But because the Board's goal is to license only those applicants who are competent to practice, having even a small number who do not practice competently is too many. Thus, regardless of the size of the group that may not always be practicing competently, the question is whether the Board's licensing standards are stringent enough. Do these LSPs lack sufficient relevant professional experience, or do they lack the technical or regulatory knowledge to do the job competently at all sites? Or is there some other factor at play here? For example, are some LSPs practicing occasionally outside their area(s) of expertise?

Some of the survey data indicate that the problem is not that LSPs lack sufficient experience. From the responses provided to one question,[88] it appears that most LSPs and most DEP staff agree that 5 years of relevant professional experience is sufficient for licensure as an LSP.

There is some data to indicate that the exam may be slightly too easy. 13% of the LSPs responding to another survey question[89] thought the exam to be too easy, while only 3% responded that it was too hard.[90] Also, as noted above, almost all applicants who are approved to take the exam end up passing, although approximately 20% have to take it more than once before they pass.

One related issue is whether the method of grading the exam should be changed. Currently, applicants simply need to achieve an overall passing score out of the 160 graded questions on the exam.[91] Since there are nine separate content areas that are tested on each exam[92], it is possible to miss most of the questions in a couple of these areas and still pass the exam. This leads to the possibility that an applicant could become an LSP without demonstrating even a minimal level of knowledge about, say, risk assessment or remediation alternatives. One suggestion made during the Program Evaluation is that applicants should be required to obtain minimum grades on each of the nine content areas in addition to obtaining the required overall passing score. The Board believes that there is some merit in this suggestion.

Some of those who provided comments during focus groups or in writing when returning their surveys to DEP raised a related but broader issue. Their concern is that applicants come from widely differing and sometime specialized backgrounds, but the Board awards them a general license to practice that is not restricted to their own area(s) of expertise. As noted above, LSPs are expected to

[88] See Appendix 1, Sec. 2, Q. 42.

[89] See Appendix 1, Sec. 2, Q. 43.

[90] The Board ascribes little weight to the views expressed by DEP staff in response to this question regarding the difficulty of the exam. Only 3 DEP staff members are currently LSPs, so the vast majority of DEP staff have not taken or seen the LSP exam and cannot know how difficult it is.

[91] Passing scores on the Board's exams have ranged between 120 and 131 out of the 160 graded questions, depending on the level of difficulty of each exam.

[92] The nine content areas and the number of graded questions from each area on each exam are as follows: site assessment (50), remediation (25), notification requirements and procedures (11), response action requirements (24), response action standards (24), submittal requirements (8), public involvement requirements (5), other statutes and regulations (5), LSP standards of professional conduct (8).

rely on the expertise of others when they encounter situations that require them to give opinions that fall in areas outside their own area(s) of expertise. But due to market pressures and other reasons, LSPs may not always rely on the expertise of others when they should. Some commenters have suggested that this is the source of the incompetent work they have seen -- LSPs providing services outside their own areas of expertise. According to this view, the problem with the competence of LSPs (to the extent a problem may exist) lies not with the Board's current licensing requirements for experience, education, and knowledge. Instead, they contend, the problem is that the Board did not embrace the concept, suggested by the Advisory Committee, of issuing different types of LSP licenses for site characterizations, risk assessments, and site remediation. According to their responses to one question on DEP's survey[93], most DEP staff and even 23% of the responding LSPs support the idea of having a separate license to perform risk characterizations.

The Board has re-examined the notion of awarding "specialty licenses" and has concluded that, even if the statute permitted them[94], the disadvantages of having them outweigh the potential increase in competence that might be gained. While agreeing that issuing specialty licenses might improve the quality of LSP practice somewhat, the Board members found that:

- a multiple-license system would be confusing and costly to PRPs, because they might have to hire multiple LSPs for a single project, and more than one LSP might be working on a disposal site at a given time;
- the current system requires LSPs to call upon the expertise of others when needed, so the current system, properly implemented, should deliver the degree of competence necessary to protect health, safety, welfare and the environment;
- moving to specialty licensing would require a time-consuming and costly revamping of major components of the redesigned 21E program, not just revision to the Board's licensing rules;
- creating three different specialty licenses would require significant and time-consuming revisions to the Board's regulations, application process, examinations, and record-keeping system, much as if the Board were to start over, completely revamping its operation;
- there are a variety of other steps the Board and DEP can take that are less drastic, time-consuming, and costly, but which should produce improved performance by LSPs; so on a cost-benefit basis moving to specialty licenses cannot be justified.

C. Board's conclusions and recommendations re: "Is the Board licensing only those who are competent?"

After reviewing all the data, the Board has concluded that, in general, its licensing process is ensuring that licensees are adequately qualified to practice. While the Board acknowledges that there may be some licensees who do not always practice with the proficiency and care that is expected, it does not appear from the data that this is necessarily a result of deficiencies in the Board's licensing standards or procedures. It may be simple carelessness, or it may be that these LSPs are failing to observe the rule of professional conduct that prohibits them from practicing outside their area(s) of

[93] See Appendix 1, Sec. 2, Q. 44.

[94] The Board's legal staff has concluded that the Board's enabling legislation appears to authorize only a single license, one to "hazardous waste site cleanup professionals." Thus, a statutory amendment may be required before the Board could adopt specialty licensing.

expertise, or it may be that market forces are driving some LSPs to cut corners. Whatever the cause, the solution appears to lie with better enforcement of Board's disciplinary rules, not major modifications to its licensing standards such as the establishment of specialty licenses.

The Board members also concurred that they are not denying licensure to those environmental professionals who deserve to be licensed.

This review has indicated, however, the need for some "fine tuning" of the licensing process. The Board is considering the following changes and solicits public comment:

1. Applicants should be required to pass each component of the exam, in addition to achieving an overall passing grade. A minimum grade should be established for each of the key content areas in the exam (e.g., site characterization/risk assessment, remediation, rules of professional conduct, etc.).

2. Applications could require submittal of information about the "number of sites" an applicant has worked on as an additional factor (along with "number of years") when considering whether an applicant has sufficient "relevant professional experience."

Issue # 2: Has the Board (in conjunction with DEP) taken adequate steps to ensure that LSPs are practicing in a satisfactory manner?

A. Steps the Board is currently taking

The LSP Board is currently taking the following steps to ensure that LSPs, once licensed, practice in a satisfactory manner:

- The Board requires that LSPs obtain continuing education in both technical and regulatory areas that are likely to maintain or enhance their ability to competently perform, supervise and/or coordinate response actions in Massachusetts. Every three years following issuance of his or her Full LSP license, each LSP must demonstrate to the Board that he or she has earned a minimum of 48 continuing education credits.[95] DEP has supported this effort to raise the knowledge, skills, and abilities of LSPs generally by sponsoring a series of training courses that focus on important aspects of the MCP.

- The LSP Board has promulgated a set of Rules of Professional Conduct to guide LSPs as they render professional services. *See* 309 CMR 4.00.

- DEP staff audit a certain percentage of the opinions submitted by LSPs each year, referring as complaints to the LSP Board those LSPs whose work is found to be in violation the MCP or

[95] Typically, one "credit" is earned for each hour of approved course instruction actually attended by the LSP.

the Board's general standard of care.[96] Even when DEP does not lodge a complaint with the LSP Board, the Notice of Audit Findings served on the PRP can have a salutary effect on the LSP's future performance by highlighting what is and is not acceptable.

- The LSP Board also accepts and investigates complaints from PRPs and the public that LSPs have violated the Board's rules of professional conduct. The Board then takes appropriate disciplinary action when the investigations reveal that sufficient grounds exist. The disciplinary actions the Board can take include the following: private censure, public censure, suspension of license, and termination (revocation) of license. In conjunction with taking any disciplinary action, the Board can also assess an administrative penalty up to and including $1000 for each act or omission that constitutes noncompliance. The Board can also decline to take disciplinary action, but provide LSPs with a warning and/or an interpretation of the Rules of Professional Conduct.

- The Board issues Advisory Rulings upon requests from LSPs for interpretations of one or more of the Board's Rules of Professional Conduct.

- Both DEP and the Board can refer LSP cases to the Environmental Strike Force and/or Attorney General's Office when an LSP is believed to have knowingly provided DEP with false or inaccurate information. *See* G.L. c. 21A, § 19J.

- Both the LSP Board and DEP have worked closely with the Licensed Site Professional Association to promote professionalism and a high level of practice by LSPs.

B. Relevant available data -- How well are LSPs performing?

In the redesigned 21E program, PRPs and their LSPs conduct response actions at most sites without direct DEP oversight. In evaluating its role in this redesigned program, the Board has sought to answer several questions: "How good is the work that LSPs are performing?" Are they following the requirements and procedures of the MCP as they manage, supervise, or periodically review response actions at sites? Are they meeting the MCP's Response Action Performance Standard and the Board's standard of care? Are adequate site characterizations being done, and are cleanups effective? At the end of the process, can the public be confident that sites overseen by LSPs pose no significant risk of harm to public health, safety, welfare, or the environment?

Not surprisingly, the opinions expressed on these issues vary widely. While there is much evidence to support the notion that a large majority of LSPs are performing appropriately and adequately, data collected during this Program Evaluation indicate that LSP performance needs to be improved to meet the expectations of the program redesign.

1. LSP Board data

[96] DEP does not refer each and every violation of the MCP to the Board. Most violations that have been referred have involved either (a) failures to address risks to health, safety, welfare, and/or the environment or (b) a pattern of other violations that demonstrates a lack of understanding or some degree of incompetence in a given area.

One set of data the LSP Board has about LSP performance come from the complaints it has received and the investigations it has conducted of those complaints. As of June 1, 1998, the Board has received 24 complaints in the categories noted below.

Complaints Filed with LSP Board

Failure to adequately assess or otherwise to comply with MCP requirements		13
Fee disputes and/or business practices		4
Incorrect Tier Classification		2
Lack of Progress		2
Acting as an LSP w/o a license	2	
Bill of Lading process		1
Total		24

Complaints are simply allegations, not evidence of actual LSP performance. Of the 24 complaints received, the Board has dismissed 10 (4 because the alleged conduct did not constitute a violation of the Board's rules of professional conduct; 4 because they alleged fee disputes/business practice issues, which the Board does not regulate; 1 for lack of jurisdiction; and 1 because it was referred to the Environmental Strike Force). Of the remaining 14 complaints, 11 remain under active consideration. Disciplinary action has been completed in connection with only 3 complaints (2 were combined and resulted in a License Revocation; the other resulted in a Private Censure). In 3 other cases, the Board has commenced adjudicatory proceedings seeking to impose discipline, but those proceedings have yet to be concluded. Thus, the Board has very little data from which to generalize about how well LSPs are performing.

2. DEP data

DEP has used data from its audit program to evaluate the overall quality of private sector work. This data can also shed light on the quality of LSP performance. Since late 1993, after the new 21E program began, DEP has conducted audits of 626 response actions managed, supervised, or periodically reviewed by LSPs. The detailed data from DEP's Notice of Audit Finding Review Project are presented in Chapter 2 above. Among the findings of this Review Project are the following:

- About ½ of all audits show some kind of problem.
- Random audits indicate that there are a few cases where the LSP has drawn the wrong conclusions.
- On the whole, there are widespread problems with LSPs supplying the documentation needed to support the their conclusions.

Further analysis of the Notice of Audit Findings Review Project indicates that the types of violations and deficiencies seen most frequently are the following:

Violations

- IRA Plan/IRA Status Report/RAM Status Report not submitted by deadline.

- Condition of No Significant Risk not achieved; area for which RAO applies not clearly and accurately identified.

- Vertical & horizontal extent of contamination not adequately defined; groundwater not properly classified; cleanup standards not properly used.

Deficiencies

- Horizontal and vertical extent of contamination not sufficiently defined; potential vapor impacts not assessed; extent of OHM not adequately characterized; groundwater at site not adequately characterized; exposure pathways not identified or evaluated.

- Boundaries of disposal site not clearly delineated in RAO; assessment and evaluations not of sufficient scope and detail to characterize risk of harm; necessary documentation such as data on monitoring well or surrounding receptors not included in RAO.

- Assessment/documentation not adequate; IRAP/IRAC/Status Report not complete.

3. Stakeholder opinion re: How well are LSPs practicing

As noted in the previous section of this Chapter, DEP surveyed the LSPs, its own staff, and the other stakeholders in the spring of 1998 to obtain their views on how well the redesigned 21E program was working. The survey results are set forth in Appendix 1 of this GEIR. The survey data reveal that PRPs are generally pleased with the quality of LSP work, as are LSPs. DEP staff, however, have significant concerns about the quality of LSP work The contrast in views between LSPs and DEP staff is illustrated by their respective answers to the following survey questions.

17. How would you describe the standard of care (i.e., quality of work) exercised by LSPs?

	LSPs	**DEP staff**
Too conservative	12 %	2%
Reasonable	84 %	48%
Careless	4 %	50 %

In addition to tabulating the responses to the survey, DEP collected all the comments that survey responders submitted along with their surveys. DEP staff's comments to the survey were especially forceful on a variety of topics related to "ensuring that LSPs are practicing in a satisfactory manner." In their view, while there are many "good" LSPs, too many other LSPs are not following the requirements of the MCP, and too little is being done about this by the Board and DEP. One commonly expressed view is that LSPs have too little concern about audits and little or no concern about disciplinary action by the LSP Board. The many DEP staff who share this view strongly support more vigorous enforcement by both DEP and the Board. One DEP staff member commented that the LSP Board will lose credibility if it does not pick up the pace of disciplinary actions.

Interestingly, while the prevailing view among LSPs is that the new program is meeting most of its goals, some LSPs are concerned that other LSPs are cutting corners. Even among LSPs, there is some support for DEP to be more aggressive with those PRPs who miss deadlines and more punitive with those PRPs and LSPs who are manipulating the system to avoid doing cleanup.

In comments submitted with their surveys, LSPs offered a number of thoughtful comments on what DEP and the LSP Board could do to improve the level of LSP performance. There is a general consensus that more regulatory training courses are needed, for two reasons. First, LSPs do not think there are enough regulatory courses offered for them to meet the Board's continuing education requirements for such courses. Second, they generally agree that while LSPs are already technically competent when they become licensed, they all could benefit from additional regulatory training, especially with respect to changes to the MCP.

One LSP commented that LSPs are under a lot of pressure from clients to minimize costs and to "stretch" the rules, and this LSP suggested that DEP and the Board develop a fact sheet that LSPs would be required to give to clients, and that clients would be required to read and sign before retaining an LSP. The fact sheet could explain an LSP's responsibilities and the obligation to exercise independent professional judgment. This LSP believed that using this fact sheet might discourage clients from exerting too much pressure on LSPs.

One non-LSP environmental consultant commented that the fact that very few LSPs have been fined or had licenses revoked for failing to meet MCP requirements has allowed PRPs to bully LSPs into not meeting performance standards. But when the Board recently announced several disciplinary actions, this commenter noticed a "very dramatic" increase in the diligence of LSPs, since many now believe there can be serious consequences if they do not perform appropriately.

C. Board's analysis and conclusions re: "Are LSPs practicing in a satisfactory manner?"

The LSP Board has concluded from its review of the audit data that many sites are being successfully managed, supervised, or periodically reviewed by LSPs without significant fault being found with the LSPs' work. (For example, post-audit follow-up was not required in 73% of the random audits, and even when post-audit follow-up was required, the LSPs' original opinions were confirmed two-thirds of the time.)

In addition, the Board believes that there are three factors that argue against too harsh an assessment of how well LSPs have been practicing.

The first factor is the **newness of the program**. This is a program -- and a profession -- that was born in late 1993, not quite five years ago. LSPs have been forced to learn the details of a completely new system, and they have been on that learning curve over the past five years. Many if not most are still learning. The Board and DEP are taking steps to promote and facilitate that learning. DEP is sponsoring training courses, and the LSP Board is requiring that LSPs obtain continuing education; so the general level of knowledge of the average LSP is likely to be increasing over time. Hopefully, this will translate into improved performance by LSPs.

The second factor is the recognition that the scope of the **LSP profession is very broad.** As discussed above in the licensing section of this chapter, the Board has been issuing a very broad license to environmental professionals whose expertise is typically focused in one or two of the main components of waste site cleanup work. It should not be surprising that an LSP who the Board knows

has expertise primarily in site characterization might exhibit certain deficiencies during the first few years in the opinions he or she submits concerning risk assessments or remediation design. Over time, with experience, continuing education, and the educational benefit audit findings can produce, LSPs should become more competent in more areas of practice.[97]

The third factor is the **rapidly changing nature of both the technical and regulatory components of the work.** Innovative technologies keep being introduced; DEP regulations and guidance documents continue to be modified, amended, and supplemented; and sampling and analytical protocols have recently been revised significantly for hydrocarbon compounds. This is not an easy profession to keep abreast of. It requires diligence and hard work, and those who do not practice as LSPs on a full-time basis find it particularly challenging. As with baseball players, it is nearly impossible for LSPs to bat 1.000 when submitting opinions.

In light of these factors, the Board's conclusion regarding the DEP data is that LSPs as a whole are practicing at a level that is about what would be expected at this juncture, almost five years into the new program, and that level of practice is improving over time.

Nevertheless, having considered all this, the Board believes that there may be minority of LSPs who practice in a manner that is not satisfactory. LSPs have a critical role to play in ensuring the protection of public health, safety, welfare, and the environment, and they cannot be given a pass when they fail to meet this basic requirement. The Board is convinced both that more needs to be done and that more can be done to improve the level of practice of these LSPs. The Board has a number of both general and very specific recommendations for doing this. These are set forth below.

D. Recommendations for improving the standard of practice by LSPs

1. <u>Facilitate Referrals of Complaints:</u> ***The Board should (a) work with DEP staff to facilitate and better coordinate the referral to the Board of complaints of substandard work by LSPs that violate the Board's Rules of Professional Conduct and (b) expand its outreach efforts to PRPs and the public.*** There is a discrepancy between the problems that DEP staff say they are spotting with LSP work and the number of complaints (only 12) they have filed with the LSP Board over the past 4 years. If the LSP Board's disciplinary process is to serve as a deterrent to substandard practice by LSPs, the Board must receive an appropriate number of referrals from DEP. Over the past year, the Board's staff has met with DEP staff in most of the regions to inform them of the steps needed to initiate complaints when they identify violations of the Board's rules of professional conduct. The Board's staff has also begun to work more closely with DEP's Audit and Enforcement Coordinator to facilitate the Board's investigations of DEP's complaints. These efforts need to continue.

The consultant hired by DEP to review the audit process has recommended that DEP increase its use of LSP complaint referrals as an explicit part of its enforcement strategy. It found a reluctance

[97] The Board recognizes that it is not always easy for an LSP to either (a) admit to a client that he or she needs to bring in another expert to oversee some aspect of the work and (b) obtain the client's consent to pay for that additional expert. Nevertheless, the Board's rules prohibit an LSP from providing professional services (without relying on the help of other qualified experts) outside the LSPs own area(s) of expertise, and the Board intends to discipline LSPs who violate this prohibition.

on the part of many DEP audit staff to refer complaints to the LSP Board, because of the time involved in making the referral and conducting all needed follow-up and also because of doubt that the Board would actually take meaningful disciplinary action.[98] To mitigate some of the reluctance by DEP audit staff to use the referral process, DEP's audit consultant recommended that DEP and the Board develop a set of criteria or "triggers" that, as a matter of policy, would require an auditor or Section Chief to initiate a complaint with the Board. The Board supports this idea.

Because a simple set of "triggers" may not encompass all of the kinds of cases that might warrant referral as a complaint to the Board, it has been suggested that the Board review the results of all comprehensive audits, and a high proportion of the technical screening and unannounced audits, that DEP's audit consultant has recommended that DEP undertake in a revised audit program (See Chapter 3). This would allow the Board to identify additional LSP conduct that might warrant disciplinary action. The Board agrees that this idea has merit.

The Board should also expand its outreach efforts to ensure that PRPs and the public know that the LSP Board exists and that the Board will investigate complaints they may have about professional services rendered by LSPs. So far the Board has receive only 11 complaints from PRPs and the public. This may mean that PRPs and the public are generally satisfied with the performance of LSPs. However, due to the fact that the Board has done little outreach to educate PRPs and the public, those who have complaints against LSPs may not know that they can present them to the LSP Board. With respect to PRPs, DEP's audit consultant has suggested that the LSP Board work with the LSPA to include complaint referral conditions, contacts, and phone numbers in the LSPA's pamphlet "*Important Information You Should Have About Licensed Site Professionals.*" (The pamphlet is designed to be given by LSPs to prospective clients.) In addition, the consultant suggests that the Board may wish to provide PRPs with a list of "triggers" warranting referral of a complaint to the Board.

2. <u>Educate LSPs:</u> ***The Board should work with DEP and the LSPA to develop more regulatory courses for LSPs.*** The Board believes that an effective way to promote a higher level of practice is by continuing to offer LSPs high-quality continuing education courses. While many private course providers present excellent technical courses suitable for LSPs each year, only a few providers have sponsored regulatory courses that meet the continuing education needs of practicing LSPs. DEP and the LSPA should continue to sponsor such courses on a regular basis. The Board should encourage this cooperative effort in every way possible. The Board itself should consider sponsoring a course on

[98] Some DEP staff are convinced that most LSP Board members, particularly those who are LSPs, are too "close" with LSPs and, as a result, too protective of them when disciplinary complaints are made. The Board strongly believes this view to be inaccurate. In fact, the Licensed Site Professional Association has recently expressed just the opposite concern - that the LSP Board is too "close" with DEP and, therefore, more likely to defer to DEP staff's views, particularly with respect to disciplinary complaints field by DEP. The Board believes that these conflicting views confirm its conviction that it is an independent body that is neither too protective of LSPs nor too solicitous of the views of DEP staff. While the board listens carefully to what DEP staff and LSPs have to say on any given issue, the Board bases all its decisions on its own analysis of what the proper outcome should be in light of its own regulations and procedures.

the Board's Rules of Professional Conduct. This course could be rated as a "core regulatory" course, ensuring that most active LSPs would take it.[99]

3. <u>Educate PRPs:</u> ***The Board should consider adopting a regulation that requires LSPs to provide all prospective clients with a fact sheet, prepared by the Board, explaining an LSP's responsibilities to follow the requirements and procedures of the MCP and to exercise independent judgment.*** The Board seeks feedback from LSPs, PRPs, and the other stakeholders on this recommendation, made originally by an LSP in comments to DEP. Would it help in discouraging clients from exerting too much pressure on LSPs? Are there better ideas for addressing this concern?

4. <u>Increase the Pace and Thoroughness of Investigations:</u> ***The Board should take steps to increase the pace of complaint investigations.*** Concern has been raised by DEP's audit consultant that the Board may not be able to handle an increase in referrals of complaints from DEP to the Board. This concern raises the specter of a backlog of complaints. To address this concern, the Board may need to take a variety of steps, including increasing the pace of investigations without sacrificing their thoroughness. The Board could establish (by contract) a pool of neutral technical experts who could be asked on a case-by-case basis to assist Complaint Review Teams whose investigations require special expertise or are too time consuming for volunteer, unpaid Board members to complete promptly. Even when the neutral expert did not conduct or participate in the investigation, he or she could play a valuable role as a sounding board, offering guidance and feedback to members of the Complaint Review Team. This approach may require additional funding to pay the experts.

Another area for improvement is the simplification of the process by which DEP auditors must support the Board in investigating complaints and conducting disciplinary hearings. The Board acknowledges that it depends a great deal on DEP staff, both to facilitate the Board's investigation of DEP complaints (and often complaints filed by others) and to testify at adjudicatory hearings. Until recently, it had been common during investigations for Complaint Review Teams to request information from DEP again and again, and each time a DEP staff person had to take time out of his or her otherwise busy schedule to help the Board gather the requested information and then explain it to the members of the Complaint Review Team. Not only did this process result in investigative delays, but it created a deterrent to the filing of further complaints due to the time demands on DEP staff that inevitably resulted. While the Board has recently revised its investigative process to obtain through a single request all the relevant information DEP has, the Board needs to continue to explore ways of investigating complaints and conducting disciplinary hearings without overburdening DEP staff.[100]

The Board should also take steps to ensure the technical thoroughness of investigations.

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[99] The Board requires that 12 of the 48 continuing education credits LSPs must obtain every three years must be obtained from courses the Board has designated as "core regulatory" because they directly focus on regulatory requirements that LSPs need to know.

[100] While the Board intends to do all it can to avoid overburdening DEP staff, DEP staff need to understand that their cooperation with the LSP Board in the investigation and prosecution of disciplinary cases against LSPs is a necessary ingredient in ensuring that LSPs perform at a high standard. Moreover, when DEP's managers prepare staffing plans, they need to factor in the considerable time it takes for audit staff and others to work with the LSP Board on disciplinary matters.

While each of the Board's Complaint Review Teams has one member who is an LSP, there is no guarantee that this member has the technical expertise or time to investigate every type of complaint, asking all the proper questions, comprehending all the necessary documents, and exercising the proper judgment about whether the LSP's conduct violated the standard of care at the time the work was performed. Here, too, having a pool of neutral technical experts to call upon would be very useful to the Board and would also enhance the credibility of the Board's investigation of complex cases. This technical expert could also review the Complaint Review Team's final report for technical accuracy and analytical soundness, as well as serve as the Board's expert witness in any adjudicatory proceeding that resulted from the investigation.

5. Enact Regulatory Revisions: In the course of conducting the review of its regulations required by Executive Order 384, the Board identified a number of possible changes to its Rules of Professional Conduct (309 CMR 4.00) and Procedure Governing Disciplinary Proceedings (309 CMR 7.00) that could aid the Board in improving the standard of practice by LSPs.

- ***The Board should revise Section 4.02(3) of its Rules of Professional Conduct to clarify that LSPs are prohibited from acting outside their own areas of expertise without relying on the expertise of others.***

Currently, Section 4.02(3) states only that an LSP "may rely in part upon the advice of one or more professionals whom the LSP determines are qualified by education, training and experience." While the Board believes that this rule implicitly prohibits LSPs from acting outside their own areas of expertise without relying on the expertise of others, the Board also believes that this rule should say so explicitly. The Board believes this revision would underscore the importance of this rule and serve to reduce those instances in which LSPs attempt to provide professional services on their own in areas of LSP practice which are beyond their own area(s) of expertise.

- ***The Board should consider adding new rules of professional conduct which regulate certain business practices and require professional integrity by LSPs when dealing with their clients and prospective clients.***

(a) Background. Currently the Board's Rules of Professional Conduct regulate only limited aspects of an LSP's business relationship with his or her client. For example, the Rule 4.04 regulates an LSP's conduct in certain situations which could present a financial conflict of interest with the client, and Rule 4.05 prohibits a willing PRP and a willing LSP from entering into a contingent fee arrangement whereby the LSP will not be paid unless a certain outcome is achieved. Currently, the Board's regulations do not otherwise directly regulate an LSP's fees or the manner in which the LSP seeks to collect those fees. The regulations also do not directly regulate the advertising that LSPs use, the representations they make to prospective clients about their fees and services, or their business practices after they have been retained by their clients.

(b) LSP Fee Disputes. Over the past few years the Board has received a number of complaints from PRPs alleging that LSPs have charged fees that exceed what the PRPs contend was promised. On other occasions the Board has received complaints that fees charged by LSPs have been excessive. The Board's response to these complaints has been to send the complainant a letter explaining that the

Board does not regulate LSPs' fees or become involved in fee disputes and suggesting that the complainant consider alternative dispute resolution ("ADR") as a means of resolving the dispute. The Board encloses a list of ADR providers with the letter. Having reconsidered the Board's current approach to fee disputes during the Program Evaluation, the Board has again concluded that it should not become involved in fee disputes. Even though lawyers now can be disciplined for charging "excessive" fees,[101] the Board believes that to establish a similar rule for LSPs and to become involved in fee disputes would be extremely time consuming and would result in little or no overall improvement in the way the 21E program is currently working. Some members believe that it would be helpful if the LSPA established a fee dispute resolution panel, much like lawyers have done through the bar associations. But the LSPA has advised the Board that it is still maturing as an organization and is not yet capable of taking on this responsibility. The Board is seeking public comment on whether it should continue to decline involvement in fee disputes.

(c) Advertising and Business Practices. Keeping in mind that the primary purpose of any licensing Board is to protect the public, the Board is considering adopting a regulation that would prohibit the following:

- advertising professional services in ways that are false, fraudulent, deceptive, or misleading. For example, this regulation could prohibit any company that has no licensed employees from advertising that it provides LSP services.
- making misleading, deceptive, untrue, or fraudulent representations in the practice or conduct of the profession or practicing fraud or deceit, either alone or in concert with others.

This regulation may promote a higher standard of professional integrity by members of the LSP profession. In addition, while the regulation may not prohibit anything that is not already prohibited by state consumer laws (see, e.g., G.L. c. 93A), it would give the Board specific jurisdiction to discipline LSPs who do not observe these laws.

(d) Withholding Reports. The Board has received a number of complaints from PRPs alleging that their LSPs are withholding completed or substantially completed reports or waste site cleanup activity opinions until the client pays the LSP a fee which the client alleges is in dispute or is not owing at all. In some cases the LSP has already been paid a significant amount and the disputed amount is small by comparison. In other cases, the "withholding" has resulted in the imposition on the PRP of annual compliance fees that would not otherwise have been imposed.

This is a complicated issue. Withholding reports and/or opinions is a standard business practice that many companies in the engineering and consulting community use to ensure that they get paid. The nature of LSP services forces LSPs to regularly present their clients with "bad news" that clients may not be willing to pay for. There is also a sense that some less affluent clients (e.g., some homeowners and small business owners) might not be served by many reputable LSPs unless those LSPs know they can withhold their opinions if necessary in order to be paid. An outright ban on "withholding" might disadvantage these PRPs by severely limiting the number of LSPs willing to serve them and, possibly, by forcing them to pay in advance for all services.

[101] The Massachusetts Rules of Professional Conduct for lawyers prohibit a lawyer from entering into an agreement for, charging, or collecting an "illegal or clearly excessive fee."

On the other hand, some Board members firmly believe that there can be instances in which the withholding of a report or an opinion can cause a delay in taking response actions needed at a site to protect health, safety, welfare, or the environment. In other cases, they believe, the "withholding" simply prejudices the client unfairly. One example of this might be a case in which the homeowner's insurer has paid the LSP, say, $200,000, but the LSP continues to withhold an RAO until a final disputed $1200 is paid, thereby forcing the homeowner to forfeit a pending sale of the property. Withholding a report in this instance may violate the Board's general standard of care at 309 CMR 4.02(1), which requires all LSPs to "act with reasonable care and diligence."

While the Board has been evaluating these complaints on a case by case basis to determine whether any violate the general standard of care, the Board does not currently have a specific regulation prohibiting withholding. Some licensing boards do have such rules. For example, while one of the rules of professional conduct for Massachusetts lawyers states that the client is entitled only to that portion of the lawyer's work product for which the client has paid, the rule goes on to prohibit a lawyer, on grounds of nonpayment, from refusing to make available materials in the client's file "*when retention would prejudice the client unfairly*."[102]

- ***The Board should incorporate into its regulations key features of its new disciplinary process, while continuing to improve the workability and efficiency of that process.***

Over the past 18 months, the Board, with input from DEP and the LSPA, has designed a detailed flowchart that outlines all the operational steps in the Board's disciplinary process. Most of these steps are not mentioned in the section of the Board's regulations (309 CMR 7.00) that describes its "Procedure Governing Disciplinary Proceedings." The Board believes that a few changes need to be made to Section 7.00 of its regulations to incorporate certain key aspects of the flowchart into Section 7.00. At the same time, however, the Board is reluctant to incorporate all or even most of the flowchart into the regulations, because it is not necessary to codify all operational procedures and because many of these operational procedures have only been utilized a few times and are still in a pilot status. DEP's audit consultant has suggested that the flowchart process is too cumbersome and time consuming, discourages DEP staff from filing complaints, and may lead to backlogs if DEP steps-up the number of complaints it refers to the Board. The consultant suggests, for example, that the Board consider using differing burdens of proof for different categories of complaints. For example, when the Board is seeking only to censure an LSP, the requirement to provide "due process" may not require that the Board afford the LSP the same degree of process that is required for a license suspension or termination.

Specific changes that the Board is considering making to Section 7.00 of its regulations include the following:

(a) <u>"Stale" matters:</u> defining the length of time after LSP conduct occurs that the Board will consider commencing a disciplinary proceeding. After that time period has elapsed, the matter would be considered to be "stale," and the Board would not take jurisdiction to investigate a complaint concerning that matter.

[102] Rule 1.16(e)(4) and (7) of the Massachusetts Rules of Professional Conduct [for lawyers].

(b) Use and composition of "Complaint Review Teams": formalizing existing practice whereby a Complaint Review Team is comprised of two Board members (one LSP and one non-LSP) and one of the Board's staff attorneys. Together, they investigate a complaint assigned to them by the Board's Professional Conduct Committee, and they report their findings back to the Committee.

(c) Voting requirement to take disciplinary action. The Board believes that it is inappropriate for those Board members who have served on a Complaint Review Team to vote with the other members (1) when that Complaint Review Team presents its recommendation whether to take formal disciplinary action against the subject of the investigation and (2) at any later stage of the disciplinary proceeding, e.g., when the Board votes whether to accept the recommended decision of the Hearing Officer after an adjudicatory hearing. Thus, the Board intends to modify Section 7.00 to specify that these members cannot participate in any vote of the Board in connection with a matter they have investigated. As a corollary to this rule change, the Board also intends to amend 309 CMR 2.04(2)(b) to state that the affirmative vote of a majority of the **remainder** of the Board is required to take disciplinary action against an LSP.

Issue #3: Is the Board adequately funded and staffed, and does it use its resources effectively and efficiently to accomplish its responsibilities?

A. Current Staffing, Budget, and Resources

The LSP Board is an independent state board established within the Executive Office of Environmental Affairs ("EOEA"). It is not a subdivision of the Department of Environmental Protection. Pursuant to G.L. c. 21A, § 19A, the Secretary of EOEA is directed to employ such staff and other persons as are required to assist the Board in the performance of its functions or duties. Shortly after the first group of LSP Board members were appointed, however, the Secretary of EOEA formally delegated to the Commissioner of DEP the power to hire staff for the Board. Thus, while the Board is independent of DEP, and the Board's staff report to and take direction from the Board, the staff are DEP employees for purposes of processing their payroll and administering their benefits. The Board's Budget and Personnel Committee participates in selecting the Board's Executive Director and oversees the process by which the Executive Director hires and manages the rest of the staff, subject to DEP's hiring and personnel rules.

Since its inception, the Board has operated with a staff of about 5 full-time equivalents. For the past few years, the staffing/functions breakdown has been as follows:

1 Executive Director
2 Attorneys (each working half-time)
1 Paralegal
1 Regional Planner
1 Administrative Assistant

The Board's annual budget over the past few years has been in the range of $300,000 to $350,000. The Board's budget for FY 1998 was $330,026, and was adequate to meet the needs of the Board and its staff, given its current level of operations. Funding for the Board comes from the Commonwealth's Environmental Challenge Fund.

The Board also charges various fees, which are deposited in the Environmental Challenge Fund. G.L. c. 21A, § 19C, requires the Board to establish an **application fee** that covers the costs of processing the application, as well as an **annual fee** that covers the costs of administering and enforcing the Board's other operations. The Board has also established an **examination fee** to cover the costs of developing and administering its licensing examinations, as well as a **renewal fee** that covers the costs of processing the renewal application LSPs file every three years to renew their licensure. The amount of each of these fees is as follows:

Application Fee	$245.00
Examination Fee[103]	$275.00
Annual Fee	$160.00
Renewal Fee	$100.00

During Fiscal Year 1999 (beginning July 1, 1998) the Board expects to generate approximately $135,000 from the Application, Annual, and Renewal fees.

The 11 Board members themselves are an immensely important resource for the Board. Each of the 10 members appointed by the Governor volunteers between 10 - 20 hours per month on Board-related matters. They receive no compensation for this work. The Board's Chairperson (a designee of the Commissioner) spends even more time on Board-related matters. Among the functions that Board members perform are the following:

- Board members serve on three-member Application Review Panels ("ARPs") that review the Board's license applications. The ARP members read the applications assigned to them and then meet to discuss whether the Board should approve or deny each one.

- Board members serve on the two-member Complaint Review Teams ("CRTs") that investigate complaints filed with the Board against LSPs. The CRT members must read all the documents and witness statements gathered by the staff attorney assigned to the CRT, and they must meet with the LSP in each case in which they intend to recommend discipline. At the end of the investigation, the CRT members work with the staff attorney to prepare a report and recommendation to the full Board regarding whether "sufficient grounds" for discipline exist.

- Board members serve on various standing and ad hoc committees. All members participate on the Board's Professional Conduct Committee, which meets monthly before each Board meeting to review new complaints filed and discuss the results of investigations that have been completed. Other standing committees deal with Applications, Continuing Education, Examinations, and

[103] The Examination Fee is paid directly to the Board's exam contractor each the time an applicant takes a licensing examination. These fees serve as the contractor's only compensation for developing and administering the Board's licensing exams.

Budget and Personnel. Some of the Board members have recently spent time serving on the ad hoc Program Evaluation Committee. All these Committees meet on an as-needed basis.

- Board members all attend the monthly Board meetings, which usually run for an entire afternoon (12:30 to 5:00 p.m.) one day per month. They frequently spend an hour or two on their own, before the meetings, reading the packet of meeting-related material (minutes, CRT reports, new complaints, special correspondence, etc.) that is mailed to them by staff before each meeting.

The Board also draws on other resources:

- Examination development and administration services. The Board has contracted out these services to a nationally-known firm, which develops and administers four licensing examinations per year. The company collects an examination fee of $275 from each examinee. The Board does not pay directly for the company's services.

- Administrative Hearing Officers. The Board has arranged for the Commonwealth's Division of Administrative Law Appeals ("DALA") to provide a Hearing Officer to conduct the adjudicatory proceedings that the Board offers to applicants who appeal the denial of their applications. Similarly, the Board has a Memorandum of Understanding with DEP's Office of Administrative Appeals ("OAA") for the provision of a Hearing Officer to conduct the adjudicatory proceedings that the Board affords to licensees who seek to challenge tentative Board decisions to take disciplinary action against them.

B. Findings and Conclusions

1. Staffing.

- *Given the number of applications that the Board is currently receiving and the number of disciplinary complaints that are being filed with the Board, the current staffing appears to be adequate.*

- *If the number of disciplinary complaints filed with the Board rises significantly, it remains to be seen whether the Board will have adequate staff to handle this load.* If more complaints are filed, there may not be sufficient attorneys/investigators to carry the increased load of investigations and formal disciplinary hearings that would result.

- *While the Board members themselves effectively serve as staff, doing much of the work of the Board, it appears that they would not be able to take on much additional investigative work on CRTs if the number of complaints filed rises significantly.* The Board members are already putting in about as many hours per month on a volunteer basis as can be reasonably expected.

2. Budget

- *As currently operating, the Board appears to be adequately funded with a budget in the range of about $330,000, as is projected for FY 1999.*

3. Adequacy of Fees

- *The Board's **application fee** ($245) appears to be set at a level that is covering the costs to the Board of processing each application.*

- *The Board's **annual fee** ($160) appears to be set at a level that is reasonable given the estimated costs of maintaining each individual's records, distributing lists of LSPs, and the like.*

- *On the other hand, all the **annual fees** taken together ($79,400) do not cover the costs of administering the Board's disciplinary program.* These costs include but are not limited to the costs of investigating complaints, conducting contested adjudicatory proceedings in disciplinary cases, and paying for overhead and staffing that should fairly be attributed to the Board's disciplinary activities. Altogether, the Board estimates that approximately half of its current budget is being devoted to carrying out the Board's disciplinary functions. Thus, the Board's fees currently do not cover the full costs of administering its disciplinary program.

- *The **examination fee** ($275) the Board authorizes the exam contractor to charge each examinee is set at a level that covers the costs of developing and administering the examinations.* This fee was recently reduced to $275 from $400 as a result of a competitive bidding process.

- *The Board's license **renewal fee** of $100 appears to be set at a level which is reasonable and will probably cover the estimated cost of processing the renewal applications.*

4. Organization and Use of Resources

- *The Board has done a good job of minimizing its need for paid staff (and its need for a higher budget) by leveraging other resources.* By using Board members to the maximum extent possible, much of the work of the Board is accomplished at no cost to the Commonwealth by a highly educated and experienced pool of individuals. In addition, by obtaining support services from DEP (payroll, personnel, information technology, etc.), the Board has greatly reduced its need for support staff. Furthermore, by obtaining Hearing Officer services at no cost to the Board, the Board has saved the Commonwealth a significant amount.

- *The Board's application review process appears to be working effectively and efficiently.* The application review process appears to be thoroughly screening each application. Furthermore, it allows complete applications to be processed in less than three months.

- *The use of the Division of Administrative Law Appeals for application appeals has proven to be only partially successful.* Initially, DALA was unable to generate a "recommended decision" for many months after all briefs had been filed. More recently, DALA appears to be providing decisions more quickly. Currently, the time between when an appeal is filed and when the Board receives the "recommended decision" is about 6 months. The Board has also noted that DALA's recommended decisions do not always contain the detailed level of analysis that may be needed to support each decision, and DALA's recommended decisions

have occasionally misstated or misapplied the Board's previous interpretations of its licensing regulations.

- *The use of DEP's Office of Administrative Appeals for adjudicatory proceedings in disciplinary cases is untested.* The Board is currently in the middle of its first contested adjudicatory proceeding at OAA, so it has little data upon which to assess OAA's performance. Given OAA's standard operating procedure and the requirements of the Standard Adjudicatory Rules of Practice and Procedure ("SARPP"), 801 CMR 1.00 *et seq.*, the Board expects that the adjudicatory process at OAA will take roughly the same time as DEP's appeals take. Thus, it may take 7 to 10 months before the Board receives a recommended decision back from OAA,

- *Complaint Review Teams may lack the technical investigative capacity to investigate complaints of misconduct that involve complicated technical matters in certain areas of professional practice.* Since one of the two Board members on each CRT is a non-LSP who may have little technical experience, and since the Board's staff attorneys have no technical experience, the only significant technical knowledge most CRTs will have is that which is brought by the LSP member. If the complaint being investigated lies in an area of practice that is outside that member's field(s) of expertise, the CRT may not have sufficient technical understanding (a) to investigate the complaint thoroughly or (b) to make judgment calls regarding the adequacy of the LSP's work that is the subject of the complaint.

- *By developing a Web site (www.state.ma.us/lsp) the Board has taken strides towards making the Board's programs and activities more visible to applicants, licensees, PRPs, and the public.*

C. Recommendations for improvement

The Board seeks public comment and feedback not only with respect to the limited set of recommendations listed below; it solicits comment and suggestions on any aspect of its operations.

- ***The Board needs to find a fair way through fees of covering the costs of administering its disciplinary program, or the statutory requirement to recover these costs should be modified.*** The Board is very reluctant to move to a "fully loaded" annual fee that covers all the costs of enforcing its Rules of Professional Conduct and disciplining those found to violate it. First, that annual fee would have to be in the $500 range if it were to cover all of the Board's costs that are not already covered by its existing fees. The Board views such a fee to be excessive, since no other professional board, to our knowledge, charges an annual fee that high. Second, the Board members believe that it would be highly unfair for those LSPs who abide by the Board's Rules of Professional Conduct to pay a fee that contributes to covering the costs the Board incurs investigating and disciplining other LSPs. Thus far, each of the fees the Board has adopted has been based on the principle that the fee should cover only those costs the Board incurs on the payer's behalf.

One idea that has been adopted by some Board's is to seek reimbursement from those who have been disciplined of the costs incurred investigating and disciplining them. The cost reimbursement would be billed at the time discipline is imposed. Those who have been investigated but not disciplined would pay nothing. This concept has been adopted by the attorney registration commission in Illinois. The Board is concerned, however, that charging for disciplinary actions may deter LSPs from exercising their right to obtain an adjudicatory hearing on the Board's tentative disciplinary action. The Board seeks comment on this idea.

- ***The Board should retain a pool of neutral, expert technical advisors to assist on a case-by-case basis in the investigation and/or adjudicatory presentation of cases that involve technical issues in practice areas in which CRT members have no particular expertise.*** Not only would having such technical advisors allow the CRTs to conduct more thoughtful and fair investigations, but use of these experts might also reduce the need CRTs now have to call on DEP staff to explain every detail, thereby making the Board's investigations less burdensome on DEP staff.

- ***The Board should consider adopting a new "late fee" for complete renewal applications that arrive after the deadline for submission.*** Current Board rules provide that LSPs must renew their licenses every three years by submitting copies of their continuing education certificates demonstrating that they have fulfilled the Board's continuing education requirements. A renewal fee of $100 must also be paid. An LSP's license will "lapse" on its expiration date if the LSP fails to submit evidence of sufficient continuing education credits. If an LSP submits the missing credits at any time during the following year, however, the license will be reinstated. Currently, there is no cost to the license for this late renewal. Some Board members believe a "late fee" of perhaps $50 to $100 should be imposed for renewing a license in this fashion, after it has lapsed. The Board seeks comment on this idea.

ATTACHMENT 1

CURRENT MEMBERS
BOARD OF REGISTRATION OF
HAZARDOUS WASTE SITE CLEANUP PROFESSIONALS

Sarah Weinstein, Chair
Acting Deputy Assistant Commissioner
Bureau of Waste Site Cleanup
Department of Environmental Protection

Gail Batchelder (*hydrogeologist slot)*
Loureiro Engineering Associates

Lawrence Feldman (*LSP slot)*
GZA GeoEnvironmental, Inc.

Wayne K. Johnson (*LSP/oil slot)*
Marane Oil

Gretchen Latowsky (*environmental slot)*
John Snow Research & Training Institute

Joseph P. Pavone, Jr. (*labor slot)*
Mass. Laborers' District Council

Debra Phillips (*LSP slot)*
Cyn Environmental Services

John P. Seferiadis (*LSP/haz. materials slot)*
Newton, MA

Debra Stake (*LSP slot)*
Fluor Daniel GTI

Mark W. Roberts, Esq. (*environmental slot)*
McRoberts & Roberts, LLP

ATTACHMENT 2

1. What percentage of the applications has the Board been approving?

LSP Applications, 9/93 - 6/98

	Applications	Approved	Denied
1993	444	68%	32%
1994	176	65%	35%
1995	88	66%	34%
1996	88	70%	30%
1997	95	64%	36%
1998*	21	71%	29%
Total	912	67%	33%

* Covers only the first six months of 1998.

2. What percentage of "approved" applicants are passing the exam?

LSP Exam Results

	Pass	Fail
Nov. 1995	305 (72%)	118 (28%)
May 1996	104 (85%)	18 (15%)
Nov. 1996	22 (65%)	12 (35%)
June 1997	39 (72%)	15 (28%)
Feb. 1998	24 (67%)	12 (33%)
Total	494 (74%)	175 (26%)

APPENDIX 1
SURVEY RESULTS

DEP sent surveys to program stakeholders to solicit feedback on how the program is working. Four surveys were sent to the following audiences:

- LSPs, DEP staff, and environmental consultants;
- Concerned citizens, environmental advocates, and local officials;
- Site owners and operators; and
- Lenders.

The sections below tabulate survey responses for questions:

- common to the first three surveys
- for LSPs, DEP staff, and environmental consultants
- Site owners and operators
- citizens and health agents regarding public involvement
- lenders (including a brief analysis)

Response rates for the surveys are as follows:

- DEP Staff - 57
- Licensed Site Professionals - 128
- Environmental Consultants - 28
- Concerned citizens/site neighbors - 41
- Health agents/officers - 62
- Other municipal officials - 16
- Site owners / operators - 394
- Lenders - 68

Section 1

1. If you have worked with the old 21E program (i.e., prior to October 1, 1993), would you say your experience with the new program was:

	Better	About the same	Worse	Unsure
DEP Staff	62%	19%	5%	14%
LSPs	89%	6%	2%	3%
Consultants	82%	4%	7%	7%
Citizens	24%	15%	0%	56%
Health agents	45%	35%	8%	12%
Other municipals	38%	31%	13%	18%
Lenders	60%	31%	0%	9%

2. Overall, do you think response actions are proceeding at a faster pace than in the old 21E program?

	Faster	Slower	No change	Unsure
DEP Staff	81%	2%	12%	5%
LSPs	93%	2%	4%	1%
Consultants	82%	---	11%	7%
Citizen	26%	12%	12%	50%
Health agent	63%	4%	31%	2%
Other municipal	44%	18%	44%	0%
Lender	62%	3%	26%	9%

3. Do you believe that cleanups in the new program are more protective of health, safety, public welfare and the environment?

	More protective	Less protective	No change	Unsure
DEP Staff	23%	44%	26%	7%
LSPs	41%	11%	46%	2%
Consultants	46%	11%	29%	14%
Citizen	21%	21%	38%	21%
Health agent	53%	8%	29%	10%
Other municipal	31%	18%	44%	7%
Lender	24%	4%	60%	12%

4. Do you believe that more private parties are meeting their cleanup responsibilities ?

	More	Fewer	No change	Unsure
DEP Staff	63%	11%	21%	5%
LSPs	78%	2%	15%	5%
Consultants	61%	---	25%	14%
Citizen	24%	21%	26%	29%
Health agent	55%	12%	27%	6%
Other municipal	50%	18%	25%	7%
Lender	55%	3%	32%	10%

5. How would you describe the standard of care (i.e., quality of work) exercised by LSPs?

	Careless	Reasonable	Too conservative	Unsure
DEP Staff	47%	46%	2%	5%
LSPs	4%	76%	11%	9%
Consultants	3%	68%	11%	18%
Citizen	35%	41%	15%	8%
Health agent	10%	80%	4%	6%
Other municipal	12%	75%	6%	7%
Lender	0%	87%	6%	7%

6. How has the standard of care exercised by LSPs changed over the past 4 years?

	Become better	Become worse	No change	Unsure
DEP Staff	34%	35%	26%	5%
LSPs	58%	4%	27%	11%
Consultants	53%	4%	29%	14%
Citizen	21%	15%	38%	26%
Health agent	47%	10%	35%	8%
Other municipal	50%	12%	31%	7%
Lender	40%	3%	44%	13%

7. Do you believe Activity and Use Limitations (AULs) can truly be enforced to "lock in" site uses to prevent future exposure to contamination left on a site after cleanup?

	Yes	No	Sometimes	Unsure
DEP Staff	10%	46%	37%	7%
LSPs	48%	14%	35%	3%
Consultants	50%	11%	28%	11%
Citizen	21%	41%	29%	9%
Health agent	35%	20%	41%	4%
Other municipal	12%	18%	63%	7%
Lender	25%	12%	50%	13%

8. In your experience, are private parties complying with the terms of AULs?

	Most are	Some are	Few are	Unsure
DEP Staff	12%	42%	14%	32%
LSPs	63%	20%	2%	15%
Consultants	32%	21%	4%	43%
Citizen	12%	26%	29%	32%
Health agent	31%	33%	8%	28%
Other municipal	18%	50%	0%	32%
Lender	41%	29%	1%	29%

9. How effective are DEP's compliance and enforcement activities in encouraging PRPs and LSPs to meet MCP requirements?

	Effective	Somewhat effective	Not effective	Unsure
DEP Staff	14%	56%	26%	4%
LSPs	39%	42%	17%	2%
Consultants	36%	43%	7%	14%
Citizen	12%	47%	32%	9%
Health agent	45%	39%	16%	0%
Other municipal	18%	82%	0%	0%

Section 2: Questions for LSPs, Consultants, and DEP Staff

1. In the new 21E program, which of the following has changed for the better, the worse or stayed the same?

Protectiveness of cleanup standards

	Better	Stayed same	Worse	Unsure
DEP Staff	41%	21%	33%	5%
LSPs	63%	26%	6%	5%
Consultants	71%	7%	15%	7%

Working with DEP

	Better	About the same	Worse	Unsure
DEP Staff	40%	26%	4%	30%
LSPs	58%	30%	11%	1%
Consultants	71%	22%	7%	--

Flexibility in performing cleanup

	Better	Stayed same	Worse	Unsure
DEP Staff	82%	7%	7%	4%
LSPs	82%	9%	8%	1%
Consultants	68%	11%	18%	3%

Cost of assessment and cleanup

	Better	Stayed same	Worse	Unsure
DEP Staff	32%	17%	30%	21%
LSPs	46%	27%	24%	3%
Consultants	29%	43%	28%	--

Reasonableness of requirements

	Better	Stayed same	Worse	Unsure
DEP Staff	56%	30%	10%	4%
LSPs	67%	19%	10%	4%
Consultants	64%	11%	18%	7%

Public involvement opportunities

	Better	Stayed same	Worse	Unsure
DEP Staff	33%	49%	9%	9%
LSPs	47%	45%	4%	4%
Consultants	57%	32%	4%	7%

2. Please rate the process which releases must follow in the MCP in terms of :

- **Efficiency** (i.e., can releases move quickly through the system?)
- **Flexibility** (i.e., are there enough available options to resolve a contamination problem?)
- **Certainty** (i.e., are there clear standards for entering and exiting the system?)

Efficiency

	Poor		*OK*		*Excellent*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	--	4%	16%	51%	17%	12%
LSPs	1%	1%	22%	58%	17%	1%
Consultants	--	--	39%	54%	--	7%

Flexibility

	Poor		*OK*		*Excellent*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	--	7%	18%	47%	18%	10%
LSPs	1%	7%	22%	55%	14%	1%
Consultants	--	7%	43%	32%	7%	11%

Certainty

	Poor		*OK*		*Excellent*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	2%	5%	17%	60%	5%	11%
LSPs	2%	3%	21%	47%	25%	2%
Consultants	3%	4%	36%	28%	18%	11%

3. Do you believe more sites are going forward with response actions in the new program?

	More	**Fewer**	**No change**	**Unsure**
DEP Staff	83%	5%	5%	7%
LSPs	89%	4%	6%	1%
Consultants	68%	---	14%	18%

4. Do you believe that risks are being reduced more quickly in the new program?

	More Quickly	**Less Quickly**	**No Change**	**Unsure**
DEP Staff	70%	2%	21%	7%
LSPs	80%	4%	14%	2%
Consultants	57%	4%	25%	14%

5. To what degree do the following factors motivate private parties to move forward with conducting cleanup actions?

Generic cleanup standards

	Weak		*Moderate*		*Excellent*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	2%	9%	29%	44%	9%	7%
LSPs	2%	7%	30%	40%	19%	2%
Consultants	3%	11%	28%	33%	18%	7%

Ability to conduct work without DEP oversight

	Weak		*Moderate*		*Excellent*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	2%	16%	26%	40%	12%	4%
LSPs	4%	7%	28%	36%	23%	2%
Consultants	--	11%	25%	43%	14%	7%

Fear of DEP enforcement

	Weak		*Moderate*		*Excellent*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	25%	28%	23%	14%	7%	3%
LSPs	8%	22%	36%	19%	13%	2%
Consultants	3%	11%	36%	25%	18%	7%

Improvement of economy

	Weak		*Moderate*		*Excellent*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	7%	17%	30%	25%	17%	4%
LSPs	7%	11%	26%	40%	13%	3%
Consultants	4%	25%	39%	11%	14%	7%

6. Do you believe the one year deadline to Tier Classify or file a Response Action Outcome (RAO) Statement acts as an incentive to conduct response actions?

	Yes	**No**	**Sometimes**	**Unsure**
DEP Staff	50%	7%	43%	----
LSPs	57%	8%	34%	1%
Consultants	64%	11%	21%	4%

7. Has the overall quality of assessment and cleanup work improved as a result of the LSP program?

	Improved	**Become Worse**	**No Change**	**Unsure**
DEP Staff	21%	32%	44%	3%
LSPs	70%	2%	25%	3%
Consultants	53%	7%	29%	11%

8. Do you find that prospective purchasers of property are willing to rely on LSP Opinions about environmental conditions?

	Often Willing	**Sometimes Willing**	**Rarely Willing**	**Unsure**
DEP Staff	32%	49%	3%	16%
LSPs	63%	32%	2%	3%
Consultants	47%	25%	7%	21%

9. Have you found that lenders are willing to finance properties based on LSP Opinions?

	Often Willing	Sometimes Willing	Rarely Willing	Unsure
DEP Staff	25%	49%	2%	24%
LSPs	55%	37%	2%	6%
Consultants	43%	32%	---	25%

10. Are private parties and LSPs willing to use innovative technologies to cleanup sites?

	Willing	Somewhat Willing	Not Willing	Unsure
DEP Staff	14%	56%	21%	9%
LSPs	21%	56%	19%	4%
Consultants	14%	68%	11%	7%

11. Do you believe the MCP's notification thresholds (Reportable Quantities and Reportable concentrations) are keeping most "non-problems" releases/sites out of the system?

	Most	Some	Few	Unsure
DEP Staff	60%	33%	4%	3%
LSPs	45%	43%	11%	1%
Consultants	54%	21%	14%	11%

12. Do you believe that releases which should be reported to DEP are not being reported?

	Many	Some	Few	Unsure
DEP Staff	23%	59%	16%	2%
LSPs	2%	41%	54%	3%
Consultants	18%	25%	46%	11%

13. Do you believe that it is easier in the redesigned program for smaller releases to move quickly through and exit the system?

	Easier	Harder	No Change	Unsure
DEP Staff	91%	5%	4%	---
LSPs	92%	4%	3%	1%
Consultants	82%	4%	11%	3%

14. Do you believe that Limited Removal Actions (LRAs) are keeping small historical releases (which exceed Reportable Concentrations) out of the system?

	Most	Some	Not Enough	Unsure
DEP Staff	42%	48%	5%	5%
LSPs	39%	46%	13%	2%
Consultants	18%	57%	11%	14%

15. Do you believe that Limited Removal Action excavation limits are being exceeded without notification to DEP?

	Often	Sometimes	Rarely	Unsure
DEP Staff	39%	47%	7%	7%
LSPs	3%	43%	44%	10%
Consultants	11%	39%	25%	25%

16. To what degree do you believe DEP staff have "let go" so that LSPs can exercise their professional judgment in response actions?

IRAs & RAMs

	Not enough		*Just enough*		*Too much*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	2%	10%	35%	25%	19%	9%
LSPs	13%	23%	54%	5%	1%	4%
Consultants	14%	14%	43%	11%	4%	14%

Tier I Permits

	Not enough		*Just enough*		*Too much*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	1%	7%	44%	23%	9%	16%
LSPs	8%	23%	53%	2%	2%	12%
Consultants	11%	11%	39%	11%	---	28%

Audits

	Not enough		*Just enough*		*Too much*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	---	12%	37%	18%	21%	12%
LSPs	25%	32%	28%	5%	1%	9%
Consultants	14%	29%	18%	11%	7%	21%

17. How consistent are the DEP Regional Offices in implementing the new MCP?

	Consistent	Somewhat Consistent	Not Consistent	Unsure
DEP Staff	16%	58%	19%	7%
LSPs	11%	58%	29%	2%
Consultants	18%	32%	36%	14%

18. Please rate the effectiveness of the following DEP actions for ensuring that response actions comply with MCP standards?

Audits

	Effective	Somewhat Effective	Not Effective	Unsure
DEP Staff	39%	40%	18%	3%
LSPs	44%	42%	9%	5%
Consultants	36%	43%	11%	10%

Screening of LSP submittals

	Effective	Somewhat Effective	Not Effective	Unsure
DEP Staff	30%	56%	9%	5%
LSPs	45%	43%	7%	5%
Consultants	39%	32%	14%	15%

Site inspections (outside formal audit process)

	Effective	Somewhat Effective	Not Effective	Unsure
DEP Staff	35%	44%	11%	10%
LSPs	21%	55%	16%	8%
Consultants	25%	57%	---	18%

LSP training

	Effective	Somewhat Effective	Not Effective	Unsure
DEP Staff	23%	63%	5%	9%
LSPs	69%	26%	2%	3%
Consultants	54%	32%	3%	11%

Issuing guidance

	Effective	Somewhat Effective	Not Effective	Unsure
DEP Staff	26%	60%	7%	7%
LSPs	69%	27%	2%	2%
Consultants	64%	25%	4%	7%

19. To maintain adequate oversight of the privatized program, DEP requires private parties to submit information at specific points in the cleanup process. Does DEP require the appropriate amount of information?

	Too Little	Right Amount	Too Much	Unsure
DEP Staff	17%	67%	9%	7%
LSPs	7%	70%	19%	4%
Consultants	----	68%	21%	11%

20. Do you believe that assessing annual compliance fees provides an incentive to PRPs to clean up their sites quickly?

	Incentive	Disincentive	No Effect	Unsure
DEP Staff	49%	5%	42%	4%
LSPs	56%	2%	41%	1%
Consultants	46%	4%	46%	4%

21. Do you believe that 21E program provides sufficient opportunities for public involvement?

	Sufficient	Somewhat Sufficient	Not Sufficient	Too Much	Unsure
DEP Staff	49%	33%	7%	7%	4%
LSPs	68%	15%	2%	14%	1%
Consultants	68%	11%	10%	8%	3%

22. Where the public has indicated an interest in becoming involved in planning response actions, do you believe they have been adequately involved?

	Adequate	Somewhat Adequate	Not Adequate	Unsure
DEP Staff	42%	46%	7%	5%
LSPs	63%	22%	3%	12%
Consultants	32%	39%	7%	22%

23. Compared to the old 21E program, has the level of public involvement changed?

	Increased	Decreased	No Change	Unsure
DEP Staff	26%	11%	54%	9%
LSPs	38%	5%	48%	9%
Consultants	46%	17%	36%	11%

24. Do you believe the Numerical Ranking System (NRS) is appropriately classifying sites into Tier categories?

	Appropriate	Somewhat Appropriate	Not Appropriate	Unsure
DEP Staff	16%	39%	42%	3%
LSPs	67%	29%	4%	----
Consultants	57%	29%	3%	11%

25. Do you believe the NRS is overestimating risks (putting too many sites into Tier I) or underestimating risk (putting too many sites into Tier II), or adequately assigning risk?

	Underestimating	Overestimating	Adequate	Unsure
DEP Staff	65%	3%	25%	7%
LSPs	8%	16%	73%	3%
Consultants	14%	14%	54%	18%

26. Do you believe the choice of different cleanup standards for soil and groundwater depending on site uses and likely exposures are clear, protective, certain and reasonable?

Clear

	Agree	Somewhat Agree	Disagree	Unsure
DEP Staff	54%	39%	5%	2%
LSPs	63%	27%	8%	2%
Consultants	57%	36%	4%	3%

Protective

	Agree	Somewhat Agree	Disagree	Unsure
DEP Staff	38.6%	38.6%	19.3%	3.5%
LSPs	74.2%	19.5%	5.5%	.8%
Consultants	64.3%	32.1%	----	3.6%

Certain

	Agree	Somewhat Agree	Disagree	Unsure
DEP Staff	25%	60%	10%	5%
LSPs	41%	49%	9%	1%
Consultants	29%	53%	11%	7%

Reasonable

	Agree	Somewhat Agree	Disagree	Unsure
DEP Staff	47%	40%	9%	4%
LSPs	44%	41%	13%	2%
Consultants	32%	54%	11%	3%

27. How confident are LSPs about performing or reviewing risk characterizations which employ Method 2 or Method 3?

Method 1

	Confident	Somewhat Confident	Not Confident	Unsure
DEP Staff	60%	28%	----	12%
LSPs	91%	5%	1%	3%
Consultants	75%	14%	----	11%

Method 2

	Confident	Somewhat Confident	Not Confident	Unsure
DEP Staff	7%	56%	23%	14%
LSPs	31%	58%	8%	3%
Consultants	17%	54%	14%	15%

Method 3

	Confident	Somewhat Confident	Not Confident	Unsure
DEP Staff	7%	35%	44%	14%
LSPs	24%	50%	23%	3%
Consultants	7%	57%	22%	14%

28. Do you believe that the risk characterization methods in the MCP adequately and consistently protect health, safety, public welfare and the environment?

Method 1

Protective	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	5%	12%	25%	30%	12%	16%
LSPs	----	1%	10%	23%	58%	8%
Consultants	----	----	11%	28%	43%	18%

Consistent	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	4%	5%	26%	30%	19%	16%
LSPs	----	4%	15%	24%	48%	9%
Consultants	----	4%	21%	32%	25%	18%

Method 2

Protective	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	7%	17%	39%	19%	----	18%
LSPs	----	6%	16%	37%	29%	12%
Consultants	----	4%	18%	28%	25%	25%

Consistent	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	5%	19%	39%	19%	----	18%
LSPs	1%	13%	26%	27%	20%	13%
Consultants	----	3%	29%	29%	14%	25%

Method 3

Protective	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	16%	23%	23%	19%	2%	17%
LSPs	5%	2%	23%	30%	29%	11%
Consultants	3%	11%	18%	25%	18%	25%

Consistent	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	19%	26%	25%	11%	2%	17%
LSPs	8%	12%	29%	19%	20%	12%
Consultants	11%	18%	25%	14%	7%	25%

29. If you have experience with Method 3, do you believe that contamination is being left in the environment that should be removed?

	Often	**Sometimes**	**Rarely**	**Unsure**
DEP Staff	37%	40%	5%	18%
LSPs	6%	31%	51%	12%
Consultants	7%	39%	32%	22%

30. To what extent do you believe remedial systems (e.g., pump and treat) are being turned off prematurely or not maintained?

	Often	Sometimes	Rarely	Unsure
DEP Staff	44%	40%	4%	12%
LSPs	8%	46%	32%	14%
Consultants	18%	36%	21%	25%

31. Do you believe that DEP has provided enough guidance and technical assistance for LSPs to comply with the MCP's Response Action Performance Standard?

	Enough	Not enough	Too Much	Unsure
DEP Staff	49%	39%	5%	7%
LSPs	46%	43%	5%	6%
Consultants	32%	43%	----	25%

32. Please rate the following BWSC education and outreach efforts on the 21E program:

MCP Q&As

Usefulness	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	----	5%	16%	54%	14%	11%
LSPs	----	1%	10%	34%	52%	3%
Consultants	----	4%	21%	18%	50%	7%

Quality	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	----	10%	16%	53%	11%	10%
LSPs	1%	----	18%	40%	38%	3%
Consultants	----	4%	21%	25%	43%	7%

Fact Sheets

Usefulness	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	----	5%	32%	39%	12%	12%
LSPs	----	1%	20%	39%	35%	5%
Consultants	----	4%	25%	21%	43%	7%

Quality	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	----	5%	33%	39%	11%	12%
LSPs	1%	1%	21%	38%	34%	5%
Consultants	----	4%	36%	21%	32%	7%

MCP Help Line

Usefulness	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	4%	30%	19%	26%	5%	16%
LSPs	13%	24%	26%	25%	9%	3%
Consultants	18%	28%	14%	18%	11%	11%

Quality	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	2%	33%	25%	16%	7%	17%
LSPs	16%	28%	28%	20%	3%	5%
Consultants	11%	28%	18%	18%	11%	14%

Technical Assistance from Regional Staff

Usefulness	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	----	----	18%	51%	14%	17%
LSPs	1%	16%	30%	34%	15%	4%
Consultants	11%	3%	29%	25%	18%	14%

Quality	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	----	----	25%	47%	11%	17%
LSPs	2%	22%	33%	30%	9%	4%
Consultants	11%	7%	29%	25%	14%	14%

LSP Training

Usefulness	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	2%	3%	25%	44%	12%	14%
LSPs	1%	3%	12%	45%	35%	4%
Consultants	11%	7%	15%	46%	7%	14%

Quality	*Low*				*High*	*Unsure*
	1	**2**	**3**	**4**	**5**	
DEP Staff	2%	3%	28%	46%	7%	14%
LSPs	2%	2%	15%	53%	25%	3%
Consultants	4%	18%	14%	43%	7%	14%

33. To what extent do you believe LSPs are "cutting corners" (e.g., failing to meet applicable standards of care) in response to PRP/market pressures?

	Often	**Sometimes**	**Rarely**	**Unsure**
DEP Staff	65%	33%	----	2%
LSPs	9%	47%	40%	4%
Consultants	7%	36%	43%	14%

34. How have the overall cleanup costs changed under the new program?

Assessment/analytical

	Decreased	No Difference	Increased	Unsure
DEP Staff	23%	23%	31%	23%
LSPs	19%	25%	55%	1%
Consultants	18%	14%	50%	18%

Remediation

	Decreased	No Difference	Increased	Unsure
DEP Staff	26%	30%	23%	21%
LSPs	37%	39%	23%	1%
Consultants	32%	25%	25%	18%

Legal

	Decreased	No Difference	Increased	Unsure
DEP Staff	16%	22%	37%	25%
LSPs	34%	32%	29%	5%
Consultants	18%	18%	39%	25%

35. To what extent does the PRP's budget for response actions influence the assessment and remedial actions chosen for a site.

	Greatly	Somewhat	Slightly	Unsure
DEP Staff	86%	9%	----	5%
LSPs	47%	41%	10%	2%
Consultants	57%	32%	7%	4%

36. An overall goal of the 21E redesign in 1993 was to find a balance between the "cookbook" method of regulatory oversight and providing "flexibility" to the PRP and LSP in making cleanup decisions. Do you believe that DEP should move more in a specific direction?

	More Specificity	More Flexibility	Stay the Same	Unsure
DEP Staff	47%	14%	32%	7%
LSPs	7%	44%	45%	4%
Consultants	10%	43%	36%	11%

37. How confident are you about the data you receive from laboratories?

Soil analyses

	Confident	Somewhat Confident	Not Confident	Unsure
DEP Staff	33%	43%	19%	5%
LSPs	56%	38%	5%	1%
Consultants	46%	46%	4%	4%

Ground water analyses

	Confident	Somewhat Confident	Not Confident	Unsure
DEP Staff	35%	48%	12%	5%
LSPs	75%	23%	1%	1%
Consultants	46%	50%	----	4%

VPH/EPH

	Confident	Somewhat Confident	Not Confident	Unsure
DEP Staff	15%	53%	26%	6%
LSPs	25%	45%	28%	2%
Consultants	14%	61%	21%	4%

38. Do you believe DEP should certify laboratories for soil analysis for 21E sites?

	Yes	No	Unsure
DEP Staff	79%	19%	2%
LSPs	72%	23%	5%
Consultants	71%	25%	4%

39. If you are an LSP, how many times has a PRP terminated or threatened to terminate your services because you believed certain response actions were needed which the PRP did not want to implement?

	None	1-5	6-10	>10	Unsure
DEP Staff	2%	1%	----	----	97%
LSPs	41%	45%	7%	3%	4%
Consultants	3%	4%	----	4%	89%

40. The LSP Board has now licensed 470 LSPs. Based on the competence and knowledge of the LSPs you have encountered, do you believe that the Board's standards for licensure are stringent enough?

	Stringent	Somewhat Stringent	Not Stringent Enough	Unsure	No Reply
DEP Staff	5%	23%	47%	16%	9%
LSPs	32%	32%	26%	8%	2%
Consultants	32%	25%	14%	11%	18%

41. Have you encountered any LSPs who you believe do not have the technical and/or regulatory knowledge or experience to provide competent professional services?

	None	1-10	10-20	>20	Unsure
DEP Staff	3%	65%	16%	9%	7%
LSPs	14%	72%	5%	5%	4%
Consultants	21%	57%	----	4%	18%

42. One qualification for licensure as an LSP is that an individual have 5 years of relevant professional experience working as a principal decision-maker on projects involving site investigation, risk characterization, and/or remediation at contaminated sites. Is this sufficient experience to be an LSP?

	Sufficient	More than Sufficient	Not Sufficient Enough	Unsure	No Reply
DEP Staff	53%	5%	25%	14%	3%
LSPs	63%	6%	23%	6%	2%
Consultants	62%	21%	----	3%	14%

43. Given what you know about the Board's licensing examination, how would you rate the difficulty of the exam?

	About Right	Too Easy	Too Hard	Unsure	No Reply
DEP Staff	22.8%	31.6%	1.8%	22.8%	21.1%
LSPs	75%	13.3%	3.1%	4.7%	3.1%
Consultants	21.4%	7.1%	7.1%	25%	39.3%

44. The LSP license is a "general" license in that it allows a licensee to render opinions regarding all major components of waste site cleanup work (site investigation, risk characterization, and remediation) and for all types of sites (simple and complex). Would the 21E program be improved by establishing separate qualifications and awarding separate licenses for the following areas of cleanup work?

Assessment

	Yes	No	Unsure	No Reply
DEP Staff	36.8%	38.6%	12.3%	12.3
LSPs	14.1%	81.3	2.3%	2.3%
Consultants	28.6%	53.6%	3.6%	14.3%

Risk characterization

	Yes	No	Unsure	No Reply
DEP Staff	54.4%	26.3%	7%	12.3%
LSPs	22.7%	69.5%	5.5%	2.3%
Consultants	42.9%	35.7%	7.1%	14.3%

Remediation

	Yes	No	Unsure	No Reply
DEP Staff	43.8%	36.8%	8.8%	10.5%
LSPs	13.3%	82%	2.3%	2.3%
Consultants	32.1%	46.4%	7.1%	14.3%

Underground storage tank removals

	Yes	No	Unsure	No Reply
DEP Staff	38.6%	40.3%	7%	14%
LSPs	9.4%	85.9%	2.3%	2.3%
Consultants	17.9%	64.3%	3.6%	14.3%

45. Are DEP and the LSP Board doing enough to ensure that the standard of practice by LSPs is sufficient to protect health, safety, public welfare and the environment?

	Doing Enough	More Should Be Done	Doing Too Much	Unsure	No Reply
DEP Staff	7%	78.9%	----	8.8%	5.3%
LSPs	54.7%	22.7%	13.3%	6.3%	3.1%
Consultants	35.7%	32.1%	7.1%	10.7%	14.3%

Part 3: Survey Questions for Citizens and Local Officials

1. What is the Tier Classification of the site with which you are most involved?

Citizen

38% Tier IA	21% Tier IC	3% Unclassified
3% Tier IB	21% Tier II	6% Unknown

Local Official

38% Tier IA	21% Tier IC	3% Unclassified
3% Tier IB	21% Tier II	6% Unknown

2. In your opinion, how do most people find out about disposal sites in their communities (please indicate top three by writing 1, 2, and 3)?

Citizen	Local Official	
29%	53%	Reading articles in local newspapers
3%	3%	Reading Legal Notices in local newspaper
0%	1%	Reading Notices in the Environmental Monitor published by the Executive Office of Environmental Affairs (EOEA)
0%	17%	Talking with Local Officials
32%	14%	Talking with neighbors
24%	0%	Talking with an environmental advocacy group
0%	0%	Visiting DEP's Office and reviewing site lists/files
0%	0%	Viewing sites lists on DEP's World Wide Web Page
3%	12%	Seeing field/construction activity in the community
0%	1%	Other

4. Do you receive or regularly review the Environmental Monitor published by EOEA ?

	Yes	No
Citizen	21%s	76%
Local Official	34%	66%

5. Are you familiar with the specific opportunities which the Massachusetts Contingency Plan regulations provide for public involvement during the assessment and cleanup of a site?

	Familiar	Somewhat familiar	Not familiar
Citizen	47%	32%	18%
Local Official	35%	47%	16%

6. How would you rate the effectiveness of the following opportunities for public involvement?

	Effective	Somewhat effective	Not Effective
Placing cleanup plans and reports in the local library for citizen review			
Citizen	24%	44%	29%
Local Official	34%	45%	17%

	Effective	Somewhat effective	Not Effective
Giving citizens the opportunity to comment on cleanup plans and reports			
Citizen	38%	44%	15%
Local Official	34%	40%	15%
Holding public meetings to provide site updates and listen to citizen concerns			
Citizen	47%	29%	15%
Local Official	52%	29%	10%
Mailing citizens fact sheets which describe site activities			
Citizen	38%	24%	15%
Local Official	37%	35%	17%

7. Are you familiar with the process for designating a site as a Public Involvement Plan (PIP) site?

	Yes	No
Citizen	82%s	15%
Local Official	44%	53%

8. If yes, how did you learn about it?

Citizen	**Local Official**	
6%	8%	Reading articles in local newspapers
9%	0%	Reading Legal Notices in local newspaper
0%	3%	Reading Notices in the Environmental Monitor published by the Executive Office of Environmental Affairs (EOEA)
0%	5%	Talking with Local Officials
12%	0%	Talking with neighbors
24%	0%	Talking with an environmental advocacy group
18%	21%	Talking with DEP
6%	6%	Other

9. From your experience, where the public has indicated an interest in becoming involved in planning response actions, do you believe they have been adequately involved?

	Adequate	Somewhat Adequate	Not adequate
Citizen	18%	44%	35%
Local Official	31%	45%	15%

10. How has public involvement been affected at sites where DEP no longer directly oversees response actions (i.e. sites where a Licensed Site Professional oversees the work)?

	Positive effect	Negative effect	No effect
Citizen	15%	56%	18%
Local Official	21%	16%	40%

TECHNICAL ASSISTANCE GRANTS (TAGs)

Local Officials - 10
Citizens - 13

1. To what extent are TAGs resulting in a *better understanding* of technical and scientific information?

	Greatly	Moderately	Slightly
Local Officials	27%	40%	33%
Citizens	72%	28%	0%

2. To what extent are TAGs resulting in *more influence* over assessment and cleanup decisions?

	Greatly	Moderately	Slightly
Local Officials	29%	29%	42%
Citizens	65%	35%	0%

3. Has use of a TAG grant affected your relationship with the PRP in any way?

	Greatly	Moderately	Slightly
Local Officials	29%	7%	64%
Citizens	50%	7%	43%

4. How would you rate the ease of the following administrative requirements of the TAG program?

	Poor				*OK*
Excellent					
Local Officials	**1**	**2**	**3**	**4**	**5**
Scoping Session	30%	0%	50%	10%	10%
Payment Voucher Process	30%	10%	50%	10%	0%
Legal Entity Formation	10%	10%	70%	10%	0%
Subcontracting	10%	0%	70%	20%	0%
Quarterly Reporting	10%	20%	40%	20%	0%
Final Annual Report	10%	10%	50%	20%	10%

Citizens	**1**	**2**	**3**	**4**	**5**
Scoping Session	10%	0%	40%	30%	20%
Payment Voucher Process	0%	8%	33%	58%	0%
Legal Entity Formation	0%	45%	45%	10%	0%
Subcontracting	0%	0%	21%	43%	36%
Quarterly Reporting	0%	0%	23%	69%	8%
Final Annual Report	0%	0%	63%	37%	0%

Part 4: Survey Questions for Site Owners / Operators

1. Based on your experience, please rate the following components of the redesigned program:

	Excellent	*OK*	*Poor*	*No Response*
Protectiveness of cleanup standards	53%	39%	3%	6%
Working with DEP	42%	47%	7%	4%
Flexibility in performing cleanup	39%	45%	11%	5%
Cost of assessment and cleanup	13%	53%	31%	4%
Reasonableness of requirements	20%	58%	19%	4%
Public involvement opportunities	23%	50%	11%	16%
Quality of LSP work	59%	32%	7%	3%

2. Please rate the process which releases must follow in the MCP in terms of :

- Efficiency (i.e., can releases move quickly through the system?)
- Flexibility (i.e., are there enough options available to resolve a contamination problem?)
- Certainty (i.e., are there clear standards for entering and exiting the system?)

	Poor		*OK*		*Excellent*	*No Response*
Efficiency	6%	10%	38%	29%	11%	6%
Flexibility	10%	14%	34%	28%	9%	6%
Certainty	11%	11%	35%	27%	9%	6%

3. To what extent does the fear of DEP enforcement motivate private parties to move forward with conducting cleanup actions?

51% Greatly 31% Moderately 13% Slightly 6% No Response

4. To what extent do assessing annual compliance fees motivate private parties to move forward with conducting cleanup actions?

33% Greatly 33% Moderately 22% Slightly 11% No Response

5. Have you found that prospective purchasers of property are willing to rely on LSP Opinions about environmental conditions (where the LSP is hired by the seller)?

26% Often willing 26% Sometimes willing 10% Rarely willing 37% No Response

6. Have you found that lenders are willing to finance properties based on LSP Opinions (where the LSP is hired by the property owner)?

25% Often willing 28% Sometimes willing 8% Rarely willing 40% No Response

7. Do you believe that it is easier in the redesigned program for smaller releases to move quickly through and exit the system?

54% Easier 6% Harder 17% No change 23% No Response

8. How have the overall cleanup costs changed under the new program?

	Decreased	*No difference*	*Increased*	*No Response*
Assessment/analytical	13%	32%	28%	26%
Remediation	18%	38%	17%	27%
Legal	19%	35%	17%	29%

Part 5: Lender Survey Results

Introduction

Lenders play an indirect, but important role in the cleanup process by providing financing for site cleanup. Under the old 21E program, lenders were reluctant to lend on contaminated sites due to concerns about potential liability and the sometimes long and costly process necessary to clean up the site and restore full value to the property.

One aim of the 1992 revisions to chapter 21E was to encourage more lending on contaminated sites. The revisions included limited liability relief for lenders and the privatized program was designed to simplify and expedite the cleanup process. The program evaluation examined the effect of the revised program on the lending community by focusing on the following key issues:

- Has lending increased under the revised program? If yes, to what extent is that a result of the program or a result of other factors? If no, what can DEP do to encourage the lending community to make loans on contaminated sites?

- Do the existing lender liability provisions provide an adequate level of comfort to lenders?

- Are lenders relying on Licensed Site Professional (LSP) opinions? Are they are willing to make loans based on these opinions, using the standards and tools of the MCP?

Program Evaluation Process

The program evaluation included three steps to evaluate the effect of the revised program on lenders:

- **A lenders' focus group.** The focus group had eight participants who provided general and anecdotal feedback on the revised program. These participants included representatives from large banks and small community banks, an environmental specialist from a large bank, a secondary lender and a representative of a professional organization of bankers.

- **A survey of lenders.** A survey was mailed out to all members of the Massachusetts Bankers Association, including large, mid-sized and smaller community banks. DEP received a total of 68 responses. The survey included 11 questions focused on lending and 11 general questions about the program. The survey also provided space for lenders to write in their own comments.

- **Other survey results.** Relevant questions were included in surveys of LSPs, Site Owners and DEP staff.

1(a). Are lenders making more loans under the revised 21E program?

The lenders who participated in the focus group stated that, in general, lenders are more likely to make loans under the privatized program. The key change is that the new program is more predictable. It provides clear thresholds to determine which properties must be reported and also when properties are clean enough to consider the cleanup to be complete.

Lenders in the focus group said that predictability and the ability to quantify risk are key factors in determining whether to make a loan. Accordingly, they said they are more likely to provide short-term construction loans on contaminated property than long-term financing. This is because lenders do not know what will happen to a site in the long run, particularly if cleanup takes longer than project construction. Likewise, lenders are more willing to lend on a site with a permanent solution rather than a temporary solution. This is because a temporary cleanup level presents an unknown risk. If the bank cannot quantify the uncertainty, it will not lend on the site.

Two survey questions addressed the lenders' experience with the revised 21E program. One question asked "If you have worked with the old 21E program, would you say your overall experience with the new program was better, about the same or worse?" Sixty-six percent said it was better, 34 percent said it was about the same. No lenders said it was worse.

A second question asked, "Do you believe more sites are going forward with response actions in the new program?" Seventy-one percent said more sites, 27 percent said no change and only 2 percent said fewer are moving forward.

1(b). To what extent can the increase in lending due be attributed to increased strength of the economy?

The lenders in the focus group stated that it is difficult to determine to what degree the increase in lending on contaminated sites is due to the stronger economy and to what degree it is the result of the new program. A community lender stated that even with the improved economy the economic viability of the project is the key. If numbers work, they will make a loan. If a site is in an economically distressed area, it may need public assistance to make the project work.

2. What are the lenders greatest concerns?

The lender survey asked lenders to evaluate the level of market risk associated with six different factors under the new 21E program. The lenders greatest concerns are (1) the complexity of the 21E program, (2) potential for cost overruns and (3) market value of the collateral. A moderate level of risk was associated with the potential for liability under Chapter 21E and the lowest level of risk was associated with reliance on licensed site professionals.[104]

Table 1: Lender's Risk

Level of Risk	Low	Average	High	Total

[104] The questionnaire asked respondents to rate the level of risk from 1 (low risk) to 5 (high risk). For the purposes of reporting the results in a concise manner, the low risk and moderate low risk responses (1 and 2) were combined and the moderately high and high risk responses (4 and 5) were combined.

				Responses
Potential 21E Liability	7 (11.5%)	8 (13%)	46 (75.5%)	61
Complexity of cleanup process	0	7 (11%)	55 (89%)	62
Potential cost overruns	1 (1.5%)	5 (8%)	54 (90%)	60
Market value of contamin. propt.	2 (3%)	8 (13%)	51 (85%)	61
Length of time to cleanup site	1 (1.5%)	13 (21%)	48 (77.5%)	62
Reliance on LSPs	14 (23%)	15 (24.5%)	32 (52.5%)	61

(a) Complexity of program

Almost 90 percent of the lenders stated that the complexity of the 21E program presented a moderately high to high market risk. This response was the same for all sizes of banks. The respondents wrote several comments related to the complexity of the program. For example, "From a lay person's perspective, the MCP can be very confusing . . . . This all adds up to a certain level of [discomfort] for the average banker. When you are unsure, you tend to be on the conservative side. . . . LSPs by their technical nature often don't break it down for us in English. Until more of an effort is made by everyone to communicate effectively, lending on contaminated sites will be impeded." Another lender stated "more progress towards streamlining the MCP would also help. . . . it is very complicated. For non-technical people, such as myself, understanding a property's status is often times problematic. If we as bankers are unable to quantify and qualify the risks associated with a deal we will either reject it entirely or price it beyond feasibility."

(b) Potential for cost overruns and market value of the collateral

Cost overruns and the value of the contaminated collateral are concerns that are related to, but not directly under the control of the 21E program. However, they present a large perceived risk and obstacle to lending on contaminated sites. Ninety percent of the lenders said the potential for cost overruns was a moderately high to high risk. Eighty-five percent of the lenders said the market value of the contaminated collateral was a moderately high to high risk. Again, the responses were similar, regardless of the size of the bank. The comments provided in the surveys explained these results. The lenders stated that it is overall risk associated with the site, including potential 21E liability that determines whether or not the lender is willing to lend. "The decision to remediate or abandon a site is predicated on the ability to make a profit or minimize a loss. It is essential that those in charge of oversight understand the economic realities that the rest of us live by."

3. Do the existing lender liability provisions provide an adequate level of comfort to lenders?

As indicated in Table 1, 75 percent of the lenders placed a moderately high to high level of risk on the potential for liability under Chapter 21E. Small, medium and large banks had similar responses to this question. The lenders generally evaluated lender liability as a lower risk than the complexity of the program, the potential for cost overruns and the market value of the collateral.

Two lenders who had greater concerns about lender liability wrote the following comments. One lender wrote, "My impression, as a banker, has always been to stay as far away as possible from anything remotely contaminated because of the potential liability. The government's approach of searching far and wide for the deep pockets just makes everybody run. Consequently, the dollars flow away from these sites rather than to them." However, this lender also acknowledged that some of this concern was more perception. He stated "the banking industry's perception, both real and imagined, of the dangers inherent with contaminated collateral must be dealt with realistically." Another lender stated "a lender should not be assessed any cleanup costs --even based on a foreclosure deed -- unless the lender caused the contamination."

4. Are lenders are relying on Licensed Site Professional (LSP) opinions? Are they are willing to make loans based on these opinions, using the standards and tools of the MCP?

Question 6 of the survey asked "How confident are you in relying on LSP opinions when reviewing applications for loans?" The respondents reported moderately high to high levels of confidence in relying on LSP opinions. The response to this question was similar for small and large banks. However, the comments indicated that larger banks will often confirm LSP opinions by hiring their own LSPs or using their own environmental staff, while the smaller banks more often rely exclusively on the LSP opinion. A lender in the focus group who is from a small community bank stated that he relies solely on the LSP report. He explained that if the LSP says it is clean, then the bank will make a loan. They do not have any means to check the quality of the LSP opinion.

Additional survey questions asked lenders about the quality of the LSPs' work. In general, lenders stated that the standard of care exercised by LSPs was reasonable (94%) and only 6% stated that it was too conservative. Approximately one-half of the respondents said that the standard of care has improved over the past four years and one-half said that there was no change. Seventy-three percent of the respondents said that the overall quality of assessment and cleanup work has improved as a result of the LSP program. Twenty-seven percent said there was no change and no respondents said that quality has decreased.

Overall, lenders reported a relatively high level of confidence in the quality of the LSPs' work. However, this did not necessarily translate into a low perception of market risk. As Table 1 illustrates, approximately one-half of the surveyed lenders perceive moderately high to high levels of risk in relying on LSPs. These concerns are greatest among the smaller banks while there is relatively little concern among the larger banks (see Table 2). Some of the comments illustrated the small banks' concerns. A few of these lenders asked for more DEP audits and for DEP to publish results of the audits in order to assist the banks in determining which LSPs are most reliable.

Table 2: Reliance on LSPs/Size of Bank

Bank Assets	Low Risk	Avg. Risk	High Risk	Total
$1-250 million	2 (8%)	7 (28%)	16 (64%)	25
$250 -500	3 (16%)	5 (26%)	11 (58%)	19
$500-1,000	6 (55%)	1 (9%)	4 (36%)	11

>$1,000	2 (40%)	2 (40%)	1 (20%)	5

Related questions were included in the surveys of LSPs, site owners and DEP staff. All groups found a high level of reliance on LSP opinions. One question asked "Are lenders willing to finance properties based on LSP opinions?" 98 percent of LSPs, 98 percent of DEP staff and 87 percent of site owner responded that lenders sometimes or often rely on LSP opinions.

Table 3: LSPs, Site Owners and DEP Staff Respondents:
Are lenders willing to finance properties based on LSP opinions?

Respondents	Rarely	Sometimes	Often	Total
LSPs	3 (2%)	48 (40%)	70 (58%)	121
Site Owners	32 (13%)	109 (46%)	97 (41%)	238
DEP Staff	1 (2%)	28 (65%)	14 (33%)	43

A second, related question asked if prospective purchasers were willing to rely on LSP opinions. Again, there was a very high level of reliance on the LSP opinions among all surveyed groups. 98 percent of lenders and LSPs, 84 percent of site owners and 96 percent of DEP staff reported that prospective purchasers sometimes or often rely on LSP opinions.

Table 4: LSPs, Site Owners and DEP Staff Respondents:
Are prospective purchasers willing to rely on LSP opinions?

Respondents	Rarely	Sometimes	Often	Total
Lenders	1 (2%)	26 (42%)	35 (56%)	62
LSPs	2 (2%)	41 (33%)	81 (65%)	124
Site Owners	41 (16%)	104 (42%)	104 (42%)	249
DEP Staff	2 (4%)	28 (58%)	18 (38%)	48

5. Are lenders making loans on sites with Activity and Use Limitations (AULs)?

Lenders are not yet clear on their views of AULs. One lender summed up the lenders' sentiments in his comments "(1) AULs have been minimally embraced with limited acceptance; (2) appraisers seem challenged to speculate on the impact on value from AULs." The survey results reflect this uncertainty. When asked if they are likely to make a loan on a property with a completed cleanup that meets state standards, but has an AUL, 55 percent of the lenders said they were "somewhat likely." Only 28 percent said they would be likely to make a loan and 17% said it was not likely. These results did not vary according to the size of the banks.

The lenders also expressed uncertainty about the long-term impact of AULs. When asked if AULs can truly be enforced to "lock in" site uses to prevent future exposure to contamination left on a site after cleanup, 57.5 percent of the lenders answered "sometimes," while 13.5 percent said "no" and 29 percent said "yes." In a related question, the lenders were asked "In your experience, are private parties complying with the terms of AULs?"
2 percent of the lenders said "few" parties are complying, 42 percent said "some," and 56 percent said "most." The larger banks tended to see most parties complying (92% said most were

complying). The smaller banks had greater uncertainty (53% said "some" were complying and 44% said "most").

Participants in the focus group also expressed some concerns over the marketability of sites with AULs. One lender said that a cleaned site with an AUL may meet DEP standards, but may be less marketable than a cleaned site without any restrictions. Another lender said that an AUL restricting an industrial site to industrial use is not a problem. But an AUL that restricts the type of structure or limits uses that otherwise could go on at the property will affect marketability.

Conclusions

Lenders reported that the new 21E program is an improvement over the old program, which the lenders described as slower and riskier from a lending perspective. In general lenders are relying on LSP opinions and on the privatized system. However, lenders find the complexity of the 21E program to be problematic. They also are concerned about the risks of potential cost overruns and reduced market value of contaminated collateral. To a lesser degree, they are also concerned about potential 21E liability. Finally, lenders have not fully accepted AULs as a tool and they are still trying to establish what impact AULs have on market risk.

Areas Where Lender Comfort Could Be Improved:

- **Complexity of the 21E Program -** One aim of the Program Evaluation is to review the regulations and procedures to determine how it can be streamlined. This work is currently underway.

- **Potential for Cost Overruns and Market Value of the Collateral** - The proposed Brownfields bill includes the Redevelopment Access to Capital (RAC) program which will address these concerns by providing environmental insurance (including cost overrun insurance) and loan guarantees to reduce these risks. It will be important to re-evaluate these issues in a few years to determine: (a) how many banks take advantage of the RAC program; and (b) if the RAC program adequately addresses these concerns.

- **Lender Liability** - The Brownfields bill will address this concern by providing a broader liability exemption for lenders and by clarifying the post-foreclosure duties required to maintain the exemption. It would also be worthwhile to re-evaluate this issue in a few years to determine if the lender liability provisions in the Brownfields bill have the intended effect.

- **Reliance on LSPs -** Although lenders report that they are currently relying on LSP opinions, DEP will be taking some steps that can increase the lenders' confidence in this reliance. DEP will be conducting more audits on sites over the next several years. The audits will identify and document any problems in site cleanups. As requested by the survey respondents, the audits may also identify individual LSPs who have a pattern of failing to meet the standard of care.

- **Activity and Use Limitations -** As part of the program evaluation, DEP conducted a review of AULs. DEP identified a number of problems with the type of restrictions, level of information provided and procedural practices. As a result, DEP is in the process of drafting a comprehensive guidance document on AULs and is providing training to LSPs.

Tabulation of Lender Survey

1. Respondents - 68

2. Do you have a division in your lending institution that specifically deals with contaminated properties and other environmental concerns?

13% Yes	86% No	1% No Reply

3. What are your total bank assets in millions of dollars (from all MA branches) as of 12/31/97?

15% under $100	28% $100-250	29% $250-500
16% $500-100	10% Over $100	2% No Reply

4. What are your total commercial real estate loans (from all MA branches) as of 12/31/97?

22% under 10 million	34% 10-49 million	10% 50-99 million	6% 100-149 million
4% 150-200 million	3% over 200 million	21% No Reply	

5. When you receive an application for a loan that will be collateralized by moderately contaminated property, how likely are you to approve the loan (assuming the applicant is credit worthy)?

3% Likely	34% Somewhat likely	62% Not likely

6. How confident are you in relying on LSP opinions when reviewing applications for loans (rating from low level of confidence to high level of confidence)?

Low		Average		High	No Response
1	2	3	4	5	
0%	1%	29%	44%	21%	4%

7. In evaluating applications for loans on contaminated sites, how would you rate the level of market risk associated with the following (rating from low risk to high risk):

	Low 1	2	3	4	*High* 5	*Unsure*
Complexity of the cleanup process	0%	0%	10%	24%	57%	9%
Length of time to clean up site	0%	1%	19%	31%	40%	9%
Reliance on Licensed Site Professionals	4%	16%	22%	24%	24%	10%
Potential 21e Liability	1%	9%	12%	18%	50%	10%
Potential for cleanup cost overruns	0%	1%	7%	37%	43%	12%
Market value of contaminated collateral	1%	1%	12%	21%	54%	10%

8. Prior to making a loan, do you ever require a Response Action Outcome (RAO) Statement to be filed with DEP, indicating that an LSP has determined that the cleanup is complete?

33% Often 33% Sometimes 21% Rarely 13% No Reply

9. Are you likely to approve a loan on a property that has met state cleanup standards but which has an Activity and Use Limitation (AUL) on the property (assume the AUL does not restrict business operations)?

26% Likely 51% Somewhat likely 16% Not likely 7% No Reply

10. Is the amount of time between filing a loan application and the loan closing longer for loans on contaminated properties than on "clean" properties?

4% No 3% 1-2 weeks longer 60% 3-8 weeks longer
16% > 8 weeks longer 17% No Reply

11. (a) Was contamination ever discovered after you made a loan on a property?

53% Yes 44% No 3% No Reply

(b) If yes, did the unexpected cleanup costs affect the borrower's ability to repay the loan?

20% No effect 36% Borrower had difficulty repaying loan 44% Borrower did not repay loan

(c) Did the unexpected discovery of contamination make you less likely to commence workout or foreclosure proceedings?

77% Yes 23% No

12. Do you believe more sites are going forward with response actions in the new program?

62% More 1% Fewer 24% No change 13% No Reply

13. Has the overall quality of assessment and cleanup work improved as a result of the LSP program?

66% Improved 0% Become worse 25% No change 9% No Reply

14. Do you find that prospective purchasers of property are willing to rely on LSP Opinions about environmental conditions?

52% Often willing 38% Sometimes willing 1% Rarely willing 9% No Reply

Appendix 2

Current Members
Waste Site Cleanup Program Advisory Committee

Don Cooper Hutchins and Wheeler Organization: Associated Industries of Massachusetts	Gregg Jordan Gregg Jordan & Associates Organization: Greater Boston Real Estate Board
Marcy Crowley Organization: Massachusetts Municipal Association	Paul Kostecki University of Massachusetts
Christopher Davis Goodwin, Procter & Hoar Organization: Boston Bar Association	Leon Lataille MWRA Organization: New England Water Works Association
Larry Feldman Goldberg-Zoino & Associates	Gretchen Latowsky The John Snow Institute / Center for Environmental Health Studies
Leslie Gerstenfeld Stone & Webster Environmental Engineering Organization: Massachusetts Public Health Association	Lauren Stiller Rikleen Bowditch & Dewey, Garrahan & Lander Organization: Small Business Association of New England
Stephen Dodge Massachusetts Petroleum Council	Robert Sargent MassPIRG
Terrance Hayes Chatham Health Department Organization: Massachusetts Health Officers Association	Thomas J. Stevenson Ambient Engineering, Inc. Organization: American Consulting Engineers Council of New England